DECEMBER, MDCCCLXIV.

THE ZOOLOGIST:

A

POPULAR MONTHLY MAGAZINE

OF

NATURAL HISTORY,

AND

JOURNAL FOR RECORDING FACTS AND ANECDOTES

RELATING TO

QUADRUPEDS, BIRDS, REPTILES, FISHES, MOLLUSKS,
INSECTS, WORMS, ZOOPHYTES, &c.

THEIR HABITS, FOOD, RETREATS, OCCASIONAL APPEARANCE,
MIGRATIONS, NESTS AND YOUNG.

Nos. CCLXXVIII. & CCLXXIX.

LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

Price TWO SHILLINGS.

NOTICE TO SUBSCRIBERS.

PREPAYMENTS for 1865.—It is the usual time to remind Subscriber that the prepayment for 1864 has expired and that for 1865 has become du fourteen numbers having been published, including Title and Index. The prepayment for the 'Entomologist' has also expired, and nine numbers have bee issued for the four shillings.

Mr. Stainton's 'Annual' will be published as usual, and will be supplie from this Office as heretofore.

	£	s.	d.
'Zoologist' for 1865 - - - - - -	0	12	0
'Entomologist' for 1865 (Thirteen Numbers) -	0	6	0
'Annual' for 1865 - - - - - - - -	0	2	6
'Zoologist' and 'Entomologist' together - -	0	17	6
'Zoologist,' 'Entomologist' and 'Annual' - -	1	0	0

Several prepaid Subscribers to the 'Zoologist' have expressed an opinion that the 'Entomologist' should not have been commenced until the end of the year, because its tendency would be to absorb the entomological matter originally destined for the elder Journal. In order to meet this objection, concerning the validity of which I express no opinion, I have determined to present the Nine Numbers of the 'Entomologist' already published to every Entomologist who desires to *commence subscribing* from the beginning of the New Year, provided the subscription be paid *before* the 31st of December, 1864.

The word "British" will for the future appear conspicuously on the wrapper of the 'Entomologist' to distinguish it emphatically from the 'Entomologist's Monthly Magazine,' which is enriched with so many and such valuable papers on "Exotic" Entomology.

NOTICE TO CONTRIBUTORS.

I am gratified to be able to state that all communications received prior to the 10th of November, when it became necessary to make arrangements for the Index, are this day published. Contributions with the following signatures have been received since that date, and will appear in the January number:—

E. R. Alston, H. Stevenson (5), J. E. Harting, W. Jeffrey, jun. (3), James Dutton, J. Jenner Weir, N. C. Tuely, T. E. Gunn, G. Gordon, H. Hadfield, H. L. Saxby, C. B. Wharton, H. W. Newman, W. W. Boulton (3), Samuel Hudson, Henry Gravil, James Varley, E. D. Hamel, J. H. Gurney (3), Thomas H. Allis (2), Edward H. Rodd.

Notes on the Aquarian Zoology of Aberystwith.
By W. R. Hughes, Esq., F.L.S.

I have selected the above title to this little paper rather than the more pretentious one of "Marine Zoology," because my explorations have hitherto been chiefly confined to the resorts of animals suitable for the aquarium. At the same time I do not neglect to record the capture of any marine animal interesting in other points of Natural History. The impetus which the writings of Mr. Gosse and other modern authors, discoursing pleasantly of Nature and Science, has given to excursionists interested in Marine Natural History, who take their annual fortnight's holiday at the sea side, to ransack every available part of the coast for specimens, has well-nigh exhausted every British locality. Doubtless there are many sheltered spots yet unexplored which would yield a rich harvest to a patient investigator, but these need to be discovered, and probably most of them are away from the conventional routes of tourist's monthly tickets. For lack of a better place, and from the circumstance of its well-known salubrious aspect, I selected Aberystwith, on the mid-Welsh coast, as a desirable spot to spend my last summer holiday, and as a likely locality to renew my aquaria with specimens in place of those given to friends or succumbed under the influence of confinement.

Beautifully situated in a bay of its own, at the bottom of the valley of the Rheidol, flanked with hills protecting it from the northern and eastern winds, and opening to a western sea unequalled for its boldness, Aberystwith (now that railway communication is secured to it direct) bids fair to become one of the most popular of British watering-places. I wish that I could say as much for the marine zoology of that place as I have on other occasions in your valuable serial in favour of Tenby, Torquay, &c.; but perhaps my experience has not been of sufficient extent to warrant me in pronouncing a definite opinion on it. The beach is of shingle of every imaginable size, regularly disposed from a pin's head to a man's head, and the descent to the sea abrupt. The depth near shore varies considerably, from five to eleven fathoms. There are bold rocks jutting out into the sea, at either extremity of the bay, to the extent of some hundred yards, on which are to be found numerous tide-pools not very well stocked with animal life.

However, three weeks of the latter end of July and beginning of August were passed most enjoyedly there in every other respect. The work of the naturalist at the sea side may be divided into four branches, *viz.*, shore-collecting, dredging, surface-dipping and home study, *i.e.* examination and identification of specimens, work with the microscope, &c. The first of these can only be well pursued at the spring tides. It is, perhaps, the easiest to follow, although sometimes the least productive, but it has the advantage of being economical (needing no guide, boat, &c.), and it admits of ladies joining in it who are "bad sailors." The shore-collecting of Aberystwith is not up to the average. Its species of Actinoida seem limited to four, *viz.*, Anthea Cereus, Bunodes crassicornis, Sagartia Troglodytes (very scarce) and Actinia Mesembryanthemum (as plentiful as blackberries). Of the last-mentioned species I secured a specimen with two disks,—a novel occurrence. Mollusca were rare, except Patella vulgaris, which vied with A. Mesembryanthemum for the possession of every conceivable bit of rock not previously occupied by Algæ; the said Algæ being well stocked with Littorinæ, which afforded a fine harvest to the adventurous youth of Aberystwith of that native genus which usually haunts the pier and quay of watering-places. I took a solitary specimen of the sand-boring Venus. Crustacea seemed limited to the genera Cancer, Carcinus, Portunus, Portumnus, Palæmon, Crangon, Pandalus, Talitrus, &c. Of Echinodermata I saw not a single specimen. The Annelida appeared rather plentiful under stones opposite the end of Pier Street, but I noticed none beyond common littoral species. Huge Chitons—the largest I have ever seen—were also found under these stones. Sponges were rare, and the specimens taken unworthy of note. It is not an easy matter to account for this paucity of animals, for I heard nothing of the ground having been rummaged by either amateur or trade collector. Indeed, on my first excursion to the rock-pools I had amusing evidence of the soil being virgin, for a young shrimp crept out of one of them, and took stock of me with the most provoking coolness, not at all offering to dart away, and actually nibbling at my finger for nearly a minute. The best reason I can suggest for this paucity is that the Rivers Ystwith and Rheidol empty themselves into the sea at one end of the town, and doubtless deteriorate the natural standard of the water. It may be, too, that the slate and shale rocks offer no secure resting-places for the soft bodies of most radiate animals.

The second branch of work at the sea-side—dredging—is more abstruse; it needs a good boat of tolerable size, too, one or more dredges suitable for different bottoms, some stout ropes, and, above all, an experienced boatman who knows something of the locality. Dredging is best pursued at the neap tides, with a breeze just sufficient to drag the dredge,—not too much, as it may get unmanageable if there are "white horses" about, and not too little, because if there is not a moderate breeze, one may get becalmed, as I have done, for a whole day, and come home without a single specimen. The town of Aberystwith offers no facilities for dredging, but after much delay and difficulty I succeeded in making the acquaintance of a trawler, the only man in the place possessing suitable—or, in fact, any—dredges, and arranged for a sail with him, but the wind suddenly changing from N.W. to S.W. caused a heavy sea, and rendered it impossible to pass the harbour bar. Added to this my holiday having run to the end of its tether, precluded the possibility (for the present, at least) of attempting to dredge the Bay. I have often thought that it would be a capital plan for the marine naturalist having time at his command, and courage enough for the purpose, to take "pot luck" on board a trawler for three or four days, and overhaul the refuse. The suggestion is not new, but I have never heard of its being attempted. I feel confident it would amply repay one for the trifling abnegation of the comforts of home.

The third occupation—surface-dipping, for Medusæ and embryonic forms of marine life—should be followed in the after part of the day when the weather is warm and the sea as calm as a mill-pool. It is undoubtedly one of the most interesting and least difficult modes of pursuing the study of Marine Zoology. It was with the dipping-net that I obtained the greatest prizes. In addition to dozens of specimens of the crystal Cydippe and Beroe, with those of rarer genera, I was so fortunate as to take three or four of the Willsia stellata, of which rare and elegant Medusa the late Professor Forbes says ("Naked-eyed Medusæ," p. 20):—"It is so transparent that usually only the reproductive star and the marginal circle of brilliant ocelli—like a mimic sun with its surrounding planets—can be perceived by the naked eye. When placed in a watch-glass, however, the singular arrangement of its vessels and the other details of its structure may easily be made out without the use of a high magnifying power." The Professor, it seems, did not find Willsia stellata at Zetland, nor further west than the Lizard on the South Coast of England, so that this capture is novel. Geryonia appendiculata (brilliantly luminous in the dark), and several specimens of the genera Turris and Thaumantias were also taken. Polyxenia Alderi was also secured.

This last gave rise to an amusing joke on the part of the boatman who was with me when I took it. Looking, as I dare say he did, with considerable disgust at my sport, and wondering why I did not follow his example in the more utilitarian object of mackerel-fishing, he asked, with some degreee of superciliousness, "And what might be the name of that jelly-fish, sir, that you've just took?" "It would not interest you very much, my friend," said I, "but, as you seem to take an interest in the specimen, I will tell you: it is Polyxenia Alderi." "Well, to be sure," replied he," "it do look summat like a X." He alluded to the cruciform appearance of the peduncle seen from below!

I will terminate this uninteresting paper with the hope that another year may carry me to a locality more rich in specimens than Aberystwith, although it cannot surpass it in other natural beauties. To it I will add what may be interesting to others pursuing the same studies as myself,—a description of an outfit necessary for sea-side explorations. It is somewhat different to that given in Mr. Lewis' 'Sea-side Studies.' Clothes and boots that are strong and will bear wetting. A Geologist's hammer, and several steel chisels of various dimensions. An oyster-knife, for removing specimens. A few feet of gutta percha tubing to act as a syphon for emptying tide-pools. A hand-net of coarse canvas, with a stout iron or brass ring, and long wooden staff, for surface-dipping. A nest of three or four glass pans, such as are used for Ferns, holding from half a gallon upwards, for the preservation of specimens while at the sea—temporary aquariums, in fact, when a handful or two of native shingle is placed at the bottom. A few wide-mouthed bottles for microscopic animalculæ, or for choice or rare specimens. A large, square, flat-bottomed zinc tank holding some gallons, with a perforated lid and the top edges prolonged a few inches to keep the water from splashing over; this for the conveyance of fishes, crustaceans, &c., requiring to be transmitted in water. Animals such as Actiniæ, Serpulæ, Echinoderms, Mollusca, &c., may be packed in a coarse canvas bag with sea-weed, and suspended in the tank. These and similar specimens will sustain injury if they are allowed to roll about loosely at the bottom of your tank.

Lastly, I have found a vasculum, which I have recently devised, a most valuable adjunct to those enumerated, either for shore or boat-collecting, or for transmitting very rare specimens, such as the Lepidogaster, rare Eolids, &c. It is of wrought iron, enamelled within and without, to prevent oxidization, and it holds nearly a gallon. It is of oblong shape, modelled in the base after a pie-dish, which has the advantage of possessing no crannies for animals to lurk in. Another advantage is that its convex bottom will allow of its being placed on any part of a rocky shore without fear of its being knocked over. The sides of the vessel are carried up to a height of seven inches from the base, which is protected by four knobs. Within two inches of the top are four small projections, on which rests an inner lid perforated. It is surmounted by a second lid, which drops over the sides, between which and the first-named lid specimens can be packed in sea-weed, the bottom being filled with water up to within an inch of the inner lid. It is carried by means of a brass wire handle passing over the ends longitudinally. It is not expensive in cost, and with care (as the enamel is apt to chip off) will last a long while. I shall be very happy to give the name of the maker to any naturalist who may wish for such a handy little article as I have found it to be in my wanderings.

W. R. HUGHES.

The General Hospital, Birmingham,
October 13, 1864.

NOTICES OF NEW BOOKS.

'*The Birds of India; being a Natural History of all the Birds known to inhabit Continental India.*' By T. C. JERDON. In two Volumes. Vol. II.; Part 1. Royal 8vo.; 439 pp.

(Second notice of the work).

IN the 'Zoologist' for 1863 (Zool. 8617) will be found a notice of the first volume of Jerdon's 'Birds of India,' and if my reader will excuse the egotism implied in my referring him to my own labours, I will beg of him to skim over, however lightly, what I have written of this valuable work, certainly one of the most important contributions to Natural History India has yet produced; and having so skimmed that first notice, to consider it as a prelude to a second and third: unless so regarded both that notice and the present one must be considered incomplete, inasmuch as the work of which it treats is incomplete also. The 'Birds of India' is now before us in its entirety, and it becomes necessary to continue, and I trust very shortly to complete, my notice also. The work itself bears witness to the profound research and unwearied industry of its author, and will be *the* authority on the Ornithology of India for years. I am little skilled in that set form of panegyric which constitutes the literary stock in trade of reviewers in general when writing on Natural History. Handsome volumes are placed in their hands, and handsome things must therefore be said: this is considered the *quid pro quo*, and author and reviewer are alike satisfied. It is impossible to read such critiques without perceiving that the writer is too slow to understand, and too indolent to study, the work on which he is expected to give an opinion; he has no choice but to consult his common-place book for a selection of platitudes carefully worded to conceal his ignorance, and he copies from a store-house of common-places a favourable or adverse platitude as the case may require. My own task is widely different: I always read the book, and always endeavour to show by the passages selected for citation the real status and capabilities of the writer; at the same time I never intentionally allow pointed merits or pointed defects to pass unnoticed. And now to my task.

As regards systematic arrangement, the plan originally laid down is consistently carried out: whatever its advantages or disadvantages the author adheres to them in a conscientious manner that evinces no infirmity of purpose, and he thus preserves a unity of uniformity throughout that greatly assists the reader. This second volume also, like the first, contains numerous little errors of phraseology, orthography and punctuation, which the author will no doubt amend whenever a second edition shall be required. It will be idle to turn over 439 pages in search of these unimportant slips of the pen; the first page will illustrate my meaning, without turning it over at all. The Timalidæ are characterized as "some with short and thick *bills*, others with long and curved *beaks*; * * * we have here represented, as far as the *beak* is concerned, thrushes, shrikes, &c., * * * but their more characteristic features are strong legs and feet and a compressed *bill*;" we are next told that "their food is *both* insects, fruits and grain," and that "the sexes differ *rarely if at all*." By the slightest attention to correcting the press all this might be avoided, greatly to the comfort of the student.

The multiplication of genera, destined doubtless to continue until every species shall constitute a genus, though certainly the greatest stumbling-block ever laid in the pathway of Science, is not to be laid at our author's door: he merely adopts the names invented by his predecessors. On this subject it is quite useless to recommend or advise: as well might one attempt to persuade cook or housemaid to renounce her hoops, as the ornithologist to abandon his multitudinous genera. Both are the diseases of youth or vanity, and will rage among the weak-minded until they become intolerable.

In assigning an English name to every Indian bird Mr. Jerdon has certainly undertaken an Herculean labour, but I scarcely see the *cui* *bono.* In giving two Latin names to each species, as Passer indicus, Passer montanus, &c., a rule is adopted which obtains the sanction of naturalists throughout the world,—like freemasonry this is a system of signs acknowledged throughout the world; but to whom, to what nation, to what district will such names as these be acceptable, "Black headed wren warbler," "White spotted laughing thrush," "Black crested yellow bulbul," "Rufous necked scimitar babbler," "Wynaud laughing thrush," Black gorgetted laughing thrush?" Are these names designed for Indian use? Only think of astonishing a native by telling him to bring you a "Rusty throated blue woodchat!" Are they for English ornithologists? if so, I opine they will meet with but slender favour, for not only do we dislike such cumbrous appellations, but we shall have to unlearn our former vocabulary, for this woodchat is no woodchat at all, but rather a redstart, for it belongs to the family Ruticillinæ. I wish to say nothing against the theory of establishing vernacular names for everything; what should we do without them? It is in practice that it must break down; the most sanguine advocate of the scheme cannot hope to see it carried out. I may be asked, Have we not established such names as "robin," "wren," "swallow," "sparrow," "crow," "magpie" and "starling?" I answer, "Certainly not! we naturalists have wisely availed ourselves of vernacular names long antecedent to the science of Natural History;" but Mr. Jerdon does just the reverse of this: thus he tells us the Erpornis xantholeuca has the vernacular name of "Dangpupho," but he rechristens it "the white bellied flower pecker." Even in those instances in which poets and novelists have conferred a kind of authority on a name, our author dissipates the illusion, and dissevers the connexion existing between name and object; thus we used to believe that a bulbul was a nightingale, but Mr. Jerdon makes a dozen genera of bulbuls, among the whole of which I can discover nothing like a nightingale. Mr. Jerdon seems to have entertained the design suggested in this country of giving English names to genera as well as species, but this is not carried out; for instance, the Latin genera Paradoxornis and Heteromorpha are both anglicized "Finch thrush;" Conostoma and Grammatoptila are both anglicized "Jay thrush;" but still more objectionable appears the plan of introducing the same English generic name a second and third time, with other genera intervening; as an example, Dumetia is anglicized "Babbler" at p. 26, then follow a host of "Laughing thrushes," "Barwings," &c., and then Acanthoptila and Malacocercus, and again anglicized "Babbler" at

p. 59: this is very confusing. "Babbler" may be a good distinctive name in either instance, but it cannot be so in all.

It is so agreeable to pen these little criticisms as I drink instruction from each page that I scarcely know how to leave off or when to wind up my commentary with a well-turned phrase or neat paragraph; I will not attempt it: I will not "study the order of going, but go," and leave my author alone with my reader, whom I am sure will be delighted with the extracts I have selected.

"*The White-headed Babbler* (Malacocercus griseus).—It is extremely common and abundant in the Carnatic, and is to be found in every hedge, avenue and garden. Like the others of its genus it always associates in families of six, seven, eight or more; even in the breeding season the parent birds feeding in company with their former companions. One may be seen suddenly dropping to the ground from some tree, and is followed in succession, though perhaps not immediately, by each of the flock. They hop about, turning over fallen leaves, and examining all the herbage around the base of trees, a very favourite spot, or on a hedge side, never venturing to any distance from cover, being aware of their tardy powers of flight. They are occasionally seen seeking insects or grain from heaps of dung, whence they have received their common denomination, as well from the French (fouille merde) as from the English (dirt bird), who are on this account prejudiced against them. They generally feed at some little distance apart from each other, but now and then, if a richer prize than usual is spied out, two or more will meet and struggle for it; and now and then one of them will make a clumsy flight after a grasshopper, seeking safety by its wings, and not unfrequently eluding its awkward pursuer. On being driven from the ground, or leaving it from choice, their hunger being satisfied, they fly up to the nearest tree, hopping and climbing up the larger branches, and if you happen to be watching them they do not stop till they have reached the top or the opposite side, whence they fly off in single and extended file as before. They often appear to pick insects off the branches of trees. They are familiar if undisturbed, feeding often close to houses, but if watched or followed they become circumspect, disperse and hide themselves. Their cry is a loud sibilous or whispering sort of chatter, which they repeat all at once, sometimes when feeding, or when any unusual sight attracts their attention, and often without any apparent object at all. They have no song. Their flight is slow and laborious, performed by a few rapid strokes of the wings, alternating with a sailing with outspread pinions. I have often found the nest of this bird, which is composed of small twigs and roots, carelessly and loosely put together, in general at no great height from the ground; it lays three or four blue eggs. I have found them breeding at all times from January to July, and even later, but do not know if they ever have two broods in the year. The black and white crested cuckoo (*Coccystes melanoleucos*) appears to select this bird to act as foster parent to her own progeny, and she lays a greenish blue egg. They are readily caught by a spring trap baited with grain, with one of their kind put in the centre as a lure. The shikra or chipka (*Micronisus badius*) is sometimes flown at them, and causes a general consternation. After the first burst of alarm and gabbling, they cease their chattering, separate, and disperse, and do not, like the bolder Mahratta babbler (*M. Malcolmi*), come to the rescue of their unfortunate companion."—P. 60.

"*The Striated Bush-Babbler* (Chatarrhœa caudata).—This babbler is the most extensively spread of all the Indian members of this group, being found throughout the whole country from Assam to Sindh, and from the N. W. Provinces and Afghanistan to Cape Comorin. The only district in which I have not seen it is Malabar. In the south of India it is usually found away from houses and villages, in the open plains that are clad with a few low and scattered bushes, and indeed it is to be met with in low jungle throughout India; but towards the North, in Central India, and in some of the Gangetic provinces, it frequents cultivated grounds, entering gardens and compounds, and sheltering itself in hedgerows. In the South it is a shy bird, flying before you from bush to bush with a sibilant sort of whistle, or, as Mr. Philipps says, 'a low, undertoned, warbling whistle,' which it often repeats. It runs or rather hops along the ground at a great rate, and with its long tail held straight out and drooping on the ground, it looks more like a rat than a bird. This likeness is so striking that it has occurred to more than one observer. It flies low, from bush to bush, with a few rapid beats of the wing, alternating with a sailing motion and outstretched wings; and though, from the nature of the ground it frequents, it is obliged to take longer flights than the Malacocerci, yet its powers of wing are very feeble, and a person on horseback can easily overtake the flock. In such case they take refuge in the nearest bush, and are with great difficulty dislodged. I have frequently seen the nest and eggs, the former almost always in a thorny bush at no height, made of roots and grasses loosely put together, and with three or four verditer-blue eggs. Mr. Philipps says that 'they bear confinement well, feeding on grain, and that all day long they are jumping from side to side of the aviary, responding to each other.'" —P. 67.

This is exactly what is wanted in British Ornithology: the dryer or museum department of the subject is performed to admiration; but that the bird once lived and breathed is almost entirely forgotten. But to proceed:—

"*The Common Madras Bulbul* (Pycnonotus hæmorhous).—It frequents gardens and cultivated ground, and low bushy jungle, but is never found in forests, and it ascends the Neilgherries to about 6000 feet only. It is usually seen in pairs or in small families, flying briskly about, restless and inquisitive, feeding chiefly on fruits, but occasionally descending to the ground, and even hopping a step or two and picking up insects. It destroys various buds and blossoms also, and is very destructive to peas, strawberries, Brazil cherries (*Physalis peruviana*), and other soft fruit. Its note, which it is frequently uttering, is an unmusical rather harsh chirrup. It has at times, however, a sweeter note, and it is said to be able to imitate the notes of other birds when caged. Its flight is direct, performed by a continued quick flapping of the wings. It breeds from June to September, according to the locality. The nest is rather neat, cup-shaped, made of roots and grass, lined with hair, fibres and spiders' webs, placed at no great height in a shrub or hedge. The eggs are pale pinkish, with spots of darker lake-red, most crowded at the thick end. Burgess describes them as rich madder-colour, spotted and blotched with gray and madder-brown; Layard as pale cream, with darker markings. The bulbul is very commonly caged in various parts of the country, and in the Carnatic it is kept for fighting, being held on the finger with a cord attached. They fight sometimes with great spirit, often, I am assured, seizing their antagonist by the red feathers and endeavouring to pull them out. When excited they often spread out these feathers laterally, so as to be seen even from above."—P. 95.

Truth is ever subversive of fiction, and this is no exception. Alas! that the bulbul, the very emblem of love, gentleness and melody, the affianced bride of the rose in the entire literature of the East, should be kept for fighting, and tethered by a packthread.

"*The Black-headed Green Bulbul* (Iora Zeylonica). It may be seen in almost every garden in the South of India. Its habits are more active and restless than those of any other member of this family, being much like those of the tits. It may be seen diligently and carefully searching the smaller branches and twigs of trees, climbing actively among them, poring under the leaves, and occasionally clinging like a titmouse from a slender twig, all the while keeping up a loud warbling strain, or a low querulous sort of note, very different from each other. It is not confined to cultivated ground, but is also a denizen of the open spaces of jungles. Its flight is performed by a succession of quick vibrations of the wing, and causes a loud whirring sound. Its food consists of various insects and larvæ, spiders, &c. The male at the breeding season now and then takes a short flight from one tree to another, slowly and in a fluttering manner, with his black tail spread, and the white feathers of the flanks puffed outwards and upwards, so as to give the appearance of a pure white rump. I have seen the nest and eggs on several occasions. The nest is deep, cup-shaped, very neatly made with grass, various fibres, hairs and spiders' web; and the eggs, two or three in number, are reddish white, with numerous darker red spots, chiefly at the thicker end. It breeds in the South of India in August and September; perhaps, however, twice a year. Burgess, speaking of its notes, says, 'truly it has a wonderful power of voice; at one moment uttering a low plaintive cry, at the next a shrill whistle.' Layard, too, who observed it in Ceylon, states that 'the note is a clear bell-like whistle, which may be imitated on an octave flute.' One of its notes, the low, plaintive one, is not unlike the word 'chee-too,' the last syllable much lengthened out, which Horsfield gives as the note of its Malayan congener. It is said by the natives of the South of India to repeat the word 'shoubhiga, shoubhiga' before rain."—P. 102.

"*The Indian Oriole* (Oriolus kundoo).—I have seen the nest several times; it is cup-shaped, slightly made with fine grass and roots, and suspended from a rather high branch by a few long fibres of grass; these do not surround the nest, but only support it on two sides. It contains three eggs, white-spotted chiefly at the large end, with a very few large dark purple blotches. I procured a nest at Saugor from a high branch of a banian tree in cantonment. It was situated between the forks of a branch, made of fine roots and grass, with some hair and a feather or two internally, and suspended by a long roll of cloth, about ¾ inch wide, which it must have pilfered from the neighbouring verandah, where the tailor worked. This strip was wound round each fork, then passed round the nest beneath, fixed to the other fork and again brought round the nest to the opposite side; there were four or five of these supports on each side. It was indeed a most curious nest, and so securely fixed that it could not have been removed till the supporting bands had been cut or rotted away. The eggs were, as before.

described, white, with a few dark claret-coloured spots. Burgess describes a nest made of grass, spiders' web, hemp and pieces of paper, placed in the fork of a tree, and two of the branches were bound together with the hemp. Theobald also found the nest, a neat cup of woven grass, attached by its side to the bough of a tree, and he describes the eggs as white, with black spots."—P. 108.

"*The Magpie-robin* (Copsychus saularis).—The magpie-robin is found throughout all India, from the Himalayas to Cape Comorin and Ceylon, and eastward to Arrakan and Tenasserim. Hutton says that at Mussooree it occurs up to 5000 feet. It is rare near Darjeeling, and I never saw it above 3000 feet. It affects chiefly wooded districts, but does not inhabit the deep jungles. Towards the South of India it is less familiar than it is in the North, for in Central India, Bengal, &c., it is often seen feeding close to houses. It is generally seen alone or in pairs, usually seeks its prey on the ground from a low perch, often hopping a few steps to pick up an insect. When it returns to its perch it generally elevates its tail, and often utters a pleasing warble. Though it frequently raises and depresses its tail, both when perched and on the ground, I cannot say that I have observed the wagtail-like flirtation of its tail noted by Hodgson, or that it throws its tail back till it nearly touches its head, as Layard has seen. Towards the evening it may often be seen near the top of some tolerably large tree or other elevated perch, pouring forth its song. I have always found its food to consist of insects of various kinds, small grasshoppers, beetles, worms, &c. Hodgson asserts that in winter they like unripe vetches and such like; but this is quite opposed to the usual habits of this group. It breeds generally in thick bushes or hedges; sometimes in a hole in a bank or tree, and occasionally in a hole in a wall or on the rafter of a house. The nest is made of roots and grass; and the eggs, four in number, are bluish white or pale bluish, with pale brown spots and blotches. Layard says that the eggs are bright blue, and Hutton that they are carneous cream-colour, but these observers must, I think, have been mistaken in the identity of the owner of the nest."—P. 115.

Here I must pause: my further extracts, together with the third and concluding part of this notice, shall appear as soon as space can be afforded.

'*On Poisoning by Diseased Pork; being an Essay on Trichinosis or Flesh-worn Disease, its Prevention and Cure.*' By JULIUS ALTHAUS, M.D., &c. London: John Churchill and Sons, New Burlington Street. 1864. Price Two Shillings.

"AND the swine, though he divide the hoof and be cloven footed, yet he cheweth not the cud; he is unclean to you. Of their flesh shall ye not eat, and their carcase shall ye not touch."—*Leviticus*, xi. 7, 8. Taking this for his text, and repeating it after the most approved fashion of our clergy, Dr. Althaus discourses long and learnedly on the fatal effects of swine's flesh, and on the worm domiciled in the muscles of the pig, which may be considered, like Pandora's box, the prison-house of the evil; its lid is lifted by an operation of Nature's own, and a host of evils liberated to run without control through the human frame. Now, whether we regard this question as anthropological on account of its intimate connexion with man; mammological on account of its dwelling-place, the bodies of Mammalia; or entozoological on account of its originating in an entozoon, matters but little; it is certainly zoological, and comes legitimately within the scope and objects of the 'Zoologist,' and now that Dr. Althaus has rendered it popular, it will certainly force itself on the attention of the readers of that journal whether they approve or not.

Since Acham's "Death in the Pot" no human calamity, with the exception of corpulence, has ever become so universally fashionable as Trichinosis; and Dr. Althaus is now dividing with the illustrious Banting the votaries of popular nosology. Both these distinguished writers have hit the right nail on the head; and, strange as it may appear, there is no kind of rivalry between them; like drum and fife they play in concert, however different the sound.

Trichinosis is a malady of the human frame which has probably raged with unremitting virulence for six thousand years, but of which man has unfortunately lived in profound ignorance; it has been working insidiously, concealed, underground I was about to say, but I only mean under-skin. How great has been our loss I need scarcely say; let us at once seek to repair it: six thousand years have been lost to us for ever. Ignorant of the existence of the disease, we have sought no cure; like the inhabitants of the Happy Valley we have not known of our misery; at last Dr. Althaus, to whose name be every honour, has not only detected the evil, but has provided a cure. A worm, a little insignificant worm, a microscopic worm, inhabits the bodies of swine, pussy-cats, jackdaws and badgers, frogs and moles, crows, hedgehogs and hawks, and when man consumes the flesh of them he takes the living worms into his stomach, and thus offers his own body to them as a domicile.

The Christian portion of the English community delights in the flesh of swine, and utterly disregards the law of Moses which I have quoted, since in one of our largest and most popular schools swine's flesh is administered to the boys twice in the week, winter and summer, hot or cold. With regard to the other animals, the Englishman is not much addicted to their consumption, at least not wittingly; the flesh of cats is unknown amongst us as a viand, unless under the appetizing form of a sausage, a saveloy or a mutton-pie. The Frenchman, on the contrary, is said to revel in cat; Dr. Althaus tells us that "in Paris cat's flesh is notoriously served up in certain cabarets, and men may become infected with Trichinosis by eating such ragouts." But unhappily for this hypothesis, although perhaps happily for the Parisian, there is no authenticated case of Trichinosis in the capital of Europe. I can hardly however assert that our neighbours escape the deleterious effects of this feline food, since catalepsy is of frequent occurrence among them, and we know, or at least we ought to know, that the very name of this fearful disease is derived from *catus*, Lin., a cat, and *lepteos*, petendus, capiendus, sumendus, that is the hunting, capturing and devouring of cats. As for jackdaws, badgers, moles and crows, hedgehogs and hawks, we have little or no knowledge of them as comestibles. Let us dismiss this part of the inquiry, contenting ourselves with the reflection that when we provide swine's flesh for schools we are compelling the rising generation to give in their adhesion to a diet of worms.

Microscopists have been for years acquainted with the existence of a minute vermiform entozoon inhabiting the human body, and until lately it was regarded as a harmless animal, and rather a microscopic curiosity than a source of danger. Its origin, as well as its life-history, long remained a problem for which neither medical practitioners nor zoologists could offer a satisfactory solution; and the untenable hypothesis of spontaneous generation—that ever-present refuge of the ignorant—was freely resorted to by way of explanation. From experiments made by Virchow, Leuckart and Claus it has, however, been clearly established that if animals, as dogs and cats, be fed with flesh containing Trichinæ, that other Trichinæ are produced in the intestines, and that these produce eggs and living progeny, which latter penetrate the coats of the intestines and "migrate into the body, more especially into the striated muscles, where, unless the animal in which they are contained should previously die, they are, after a time, encysted, and wait for the moment when they may be eaten by another man or animal to undergo the same changes as before." Thus writes our author, and probably with truth, but in how many instances must they wait in vain; for notwithstanding what I have already said of cats and pigs being consumed by man, surely with man himself the race must terminate, for what animal devours human flesh in these regions where sepulture is universal! Still this branch of the inquiry is scarcely worth pursuing, since other animals, as Musca vomitoria are known occasionally to perish by thousands in the coffin that contained their pabulum.

Flesh containing Trichinæ when once received into the stomach "is dissolved by the gastric juice, and the Trichinæ become freed from their cysts. * * * They begin to move about; they lose their spiral figure, and become stretched, so as to appear somewhat similar to Ascarides. They soon grow rapidly, * * and at the same time generative organs are developed." The males and females are readily distinguishable, and it seems to be ascertained that after the impregnation of the females the males die, for although at first the sexes are nearly equal in number, from ten to fourteen days after the infected meat has been eaten the males have entirely disappeared, females only remaining. "Six weeks after feeding [? after the infected flesh has been eaten] no trace of either males or females is to be discovered in the intestines." Each female contains from three hundred to five hundred ova, which, like those of a bird, are found in a state of successive development, so that many days elapse between the extrusion of the first and last of this large family; the embryo is born in an active and worm-like state, very considerably resembling its parent. "Soon after birth the [juvenile] Trichinæ leave the intestines and migrate into the peritoneal sac;" on their passage "they have to perforate the coats of the bowel, which, on account of their minute size, they probably accomplish without tearing the membranes, but merely driving them as it were asunder," a description which I do not precisely comprehend. "This process," continues the author, "is facilitated by the shape of their head, which may, under certain circumstances, become sharply pointed. From the peritoneal sac they proceed to all the striated muscles, excepting only the heart, in which they are scarcely ever found. They arrive in the muscles in about ten days after their parents have been eaten, and penetrate through the sarcolemma into the interior of the muscular substance, which is by their invasion considerably altered." My reader will of course detect a discrepancy in date, which I am unable to explain, and which remains for a somewhat more methodical writer than our author hereafter to clear up. "In moving through the fibres the worms cause, according to the researches of Virchow and Colberg, an acute parenchymatous inflammation of the muscular tissue; the fibres lose their stripes and gain a homogeneous appearance, in others the substance is changed into fine granules, small cells are found in rapid proportion." "If men or animals thus trichinosed survive these multiple [?] inflammations, convalescence sets in towards the fourth week from the commencement of the disease." Without dwelling on the meaning of the word "multiple," which does not appear quite appropriate, I may here remark that the contingency of men or animals thus trichinosed surviving the attack does not appear very remote, as we shall immediately see. "Mr. Curling found Trichinæ in the muscles of two robust men who were killed while in the apparent enjoyment of good health; one by fracture of the skull, the other by fracture of nearly all the ribs." This, taken in conjunction with the fact that they also occur in the most delicate pork fed purposely for the table, seems to show that the disease is by no means constant in its lethal effects.

Indeed our author seems himself dissatisfied with the number and authenticity of the recorded cases of Trichinosis, and appeals for support to very apocryphal sources: he lays claim, and as it appears to me, very unwisely, to those human maladies of the origin of which we are in utter darkness; but I will let him speak for himself. "There are, in fact," writes this learned physician, "many cases on record in medical literature, which were at the time believed to be such, of gastric, rheumatic or typhoid fever, or in which even poisoning with criminal intent was suspected, but which we may now safely claim as instances of Trichina disease." If this view of the case be taken there will be a complete revolution in medical jurisprudence. The allopath will treat the victim with picronitrate of potash instead of trying the murderer at the Old Bailey; and the homœopath may perchance relieve kleptomania itself by the exhibition of an infinitesimal portion of measly pork. But Dr. Althaus shall himself give his own illustration of what he considers "may safely be claimed as an instance of Trichina disease." I will neither add nor subtract a word.

"In 1845 a company of eight gentlemen being engaged in the inspection of schools in Saxony, dined together at an inn, and partook, amongst other dishes, of ham and sausages. They all, with the exception of one, who merely drank a glass of claret, fell ill, and four died. Suspicion fell upon the meal and the host. The wine from which they had drank was analysed, and, although no poison was found, the host continued to be suspected, and at last was obliged to emigrate."

I confess I read this case in the full expectation of finding a sequel that would establish the Doctor's "claim," but not a word of the kind is to be discovered; the ham was not measly, the sausages were not feline; and there is not a single reason assigned why the minute Trichina should be charged with this quadruple murder.

But I come to the "perfect cure;" the entomologist will be delighted to find it exists in that well-known fluid, benzine or benzole, with which he has for so many years ungreased his favourite Lepidoptera. "Professor Mosler has found as the result of careful experiments that benzine is a poison for Trichinæ. It rapidly kills lice and other vermin and seems to have the same effect upon Cysticercus and Trichina. But benzine is also a powerful poison for large animals and man; and if used in the treatment of Trichinosis should be employed with especial caution. A rabbit can take ten grains, a pig thirty grains, and a cow half an ounce of benzine per diem, without its producing alarming symptoms of poison." Very good! but why give it to a cow, which is not enumerated in the list of animals subject to Trichinosis. "Up to the present time benzine has not yet been employed in Trichinosis in man, but its use in the more severe forms of this affection seems justifiable." Of course it does! why not give it to man? why persecute the "pretty cow that made sweetest milk to soak your bread," running the risk of poisoning your little ones? why not give it to "gentlemen engaged in the inspection of schools?" It is certainly unusual in cases of human infirmity to administer the remedy to our cattle. What should we say to our family Æsculapius if he suggested our giving Dutch drops to our short-horns when we were afflicted with excruciating lumbago?

In conclusion, I can only repeat that Dr. Althaus has hit the right nail on the head in selecting Trichinosis as a theme for a fashionable audience; but I fancy he will make but slight impression on the hard-headed and argumentative zoologist, the man who has that disagreeable habit of inquiring into the why and the wherefore of every assertion. But this is of no consequence. Let the Doctor dismiss the dull sceptic, from whom he has been labouring to obtain some slight admission, with the grand and crushing burst of indignation launched by Sergeant Buzfuz at the humiliated Weller, "It's perfectly impossible, my lord, attempting to get at any evidence through the impenetrable stupidity of this witness! Stand down, Sir."

EDWARD NEWMAN.

Further Natural History Notes from Norway.
By GEORGE NORMAN, Esq.

DURING the past summer I paid another visit to Norway, and venture to make a few extracts from my note-book. On this tour, instead of taking the Bergen district, as in 1863, I went to Christiansand, Christiana, up the Gudbrandsdal, and over the Dovrefjeld, to Bjerkager, near Trondjhem.

Fieldfare.—These birds are by no means so abundant in this neighbourhood as in the Bergen district. During my trip this summer, until I came to Dombaas, at the foot of the Dovrefjeld, I saw very few fieldfares, and it was only on descending to Nystuen and Bjerkager that they seemed more plentiful. Although I looked diligently I only found three or four nests with eggs, some of them quite fresh, while others were strongly incubated. Saw many young birds quite strong on the wing.

Redwing.—Did not succeed in taking the eggs of this bird, owing, I suppose, to its breeding earlier than the fieldfare. I found one nest with young ones; it was situated near the ground in a prostrate juniper-bush near Hjerkin. Remembering the circumstance that on leaving home the subject of the song of this bird was causing much correspondence in the 'Zoologist,' I was determined to pay particular attention to the subject when I had an opportunity. The conclusions I arrived at were, that the most earnest advocate in favour of the redwing singing in England would alter his views, could he only for a moment hear the bird *really* singing as he does in Norway. In comparison with the true song, the twittering and chattering, so often heard in England, can certainly not be called singing at all. On one calm, hot evening, while staying at Bjerkager, near Trondjhem, I was smoking my evening pipe, about half-past 11 o'clock, when I heard a dozen at least of these birds singing in the neighbouring pine forest. I made a note at the time in my memorandum book that the song much resembled that of the thrush, but was much more abrupt and shrill.

Great Black Woodpecker.—Shot one of these birds as he flew out of the hole of a tree at Nystuen. The hole was in the trunk of a large aspen poplar, and, thinking of my absent friend Dobrée, I made sure of securing eggs for his collection; consequently I went about a mile to borrow a ladder, which I carried this distance on my shoulders: this trouble was all in vain, the hole being evidently only used to sleep in. I believe these birds are not uncommon.

Northern Jay.—Shot only one specimen, and this a young one in immature plumage. This occurred also at Nystuen. I do not believe they are found south of the Dovre range. It has a strange outlandish appearance, with its bushy head and turned-up beak. During my search for others, my dog caught a young woodcock, and among the birds which I obtained were a godwit, solitary snipe and a sandpiper.

Sneehättan.—On the 14th of July I, with two friends, ascended Sneehättan. We took two guides with us, and five ponies to take us to the foot of the mountain, two Norwegian (fourteen English) miles from the station of Hjerkin. The day was intensely hot,—so hot, indeed, that the skin was completely blistered off our necks and faces. This great heat rendered the ascent the more fatiguing. For the two Norwegian miles we passed over extensive dreary tracts of moorland, covered with stunted dwarf birch, Salix herbacea, Azalea procumbens (in beautiful flower). Many streams had to be forded, the channels of some nearly filled up with the remains of enormous snowdrifts. Soon this changed, and we passed some large frozen lakes, and after this came upon a dreary steep expanse of terrible blocks of stone, varying in size from a man's head to that of a goodly sized house: these stones were all covered with a beautiful yellow lichen in small spots and patches on a dark ground, and reminded me constantly of the skins of the large tropical lizards. After a fatiguing climb of perhaps three hours, passing *en route* many large snow-fields, we arrived at the base of the snowy cone: this took perhaps twenty minutes to ascend, being quite hard frozen, and very slippery. Arrived at the top, I found the temperature 35°, on the snow 32°. A cold icy gale of wind soon drove us down again; the descent nothing near so fatiguing as the climb up. In climbing the mountain, before arriving at the permanent snow, we passed large masses of the beautiful Silene acaulis, Azalea procumbens, Ranunculus glacialis, Pedicularis lapponica. Immediately below the snow line, the only traces of vegetation were stunted plants of Salix herbacea, Betula nana and rein-deer moss. Hearing that some ladies who had made an ascent some years before had disturbed many ptarmigan and two snowy owls, I and my companions on this occasion took up with us a breech-loading carbine and a double-barrel breech-loading shot gun. Thus fully prepared, we should have done good execution among any game we could possibly meet. Unfortunately we never saw anything nearer the object of our wishes than the droppings of apparently an alpine hare on the snow. Two large eagles were seen in the distance.

Blue-throated Robin.—While staying at Hjerkin, and rambling about the open fjell, opposite the station, my attention was called to the note of a bird quite unfamiliar to me. The birds seemed to be in some abundance in a clump of birch bushes. The note somewhat resembled that of the whinchat or wheatear, but instead of the final "tick, tick," the bird uttered a deep bass "tuck, tuck," very softly. Not being able to recognise the bird, I shot one, which I at once saw was a young specimen of the bluethroated robin (*Motacilla suecica*). This was a prize, for the bird and its habits alike were quite new to my experience. I afterwards shot nine specimens, some of them magnificent old males, with the azure-blue throats. In all but two specimens the patch in the centre of the blue was chestnut-brown: in the exceptional two we could just trace some white feathers in the margin; I failed, however, in seeing one with the white space fully developed, as in the British-shot specimen figured by Yarrell. I watched closely with my glass, and had any appeared with conspicuous white patches, I could scarcely have overlooked them. On my return to Christiana I spoke to Professor Essmark upon this subject. This gentleman seemed to think the Norwegian bird never had this patch otherwise coloured than chestnut-brown, while birds shot in Germany and France had the same space invariably white. This is a subject that requires further research. I looked in vain for a late nest with eggs. The birds when disturbed invariably alighted again near the roots of the bush, and crept about like wrens.

Adders.—Adders seem to be abundant in the higher parts of the Dovre, for during my stay at Hjerkin I saw two very large specimens, but owing to their quickness failed in catching either.

Ring Ouzel.—Ring ouzels seemed to be building in some rocks to the eastward of the station at Hjerkin, for on approaching the locality I was mobbed by a number of these birds, who were evidently alarmed at my invasion of their breeding-place.

Cuckoo.—Cuckoos were seen and heard on many occasions. They were almost invariably followed and mobbed by a crowd of small birds. Hearing the approach of such a mob, I dropped gently into the bushes, and saw the cuckoo fly into a bush within twenty yards of me. Here he was set upon by a flock of small birds, and while defending himself, rather to my surprise, uttered his well-known note. There was no mistaking the note, which, being uttered so near me, appeared to sound more hollow, soft and flute-like than I ever remember to have noticed before.

Insects.—In driving over the Dovre, I noticed thousands of a small obscure, skipper-like insect settling on the road-side, but very nimble and difficult to catch; this turned out to be Psodos trepidaria. A small azure-blue Polyommatus Pheretes was very abundant indeed, along with other blues, which I did not succeed in capturing: whole boxes might have been filled with P. Pheretes in a few hours. I saw one magnificent specimen of Papilio Machaon near Oien, and some other large butterflies, as I drove along, but did not identify them. Of Fritillaries I saw an immense quantity, and these in great variety. Among these I recognised Melitæa Athalia, Argynnis Euphrosyne, A. Pales and A. Freyja. About Hjerkin and the higher fjell an exceedingly common insect was Erebia Manta, and occasionally I observed E. Ligea. Hipparchia Semele, a beautiful variety, was very abundant near Christiansand. Setina irrorella I frequently brushed off the low willow bushes on the fjell top.

Flowering and other Plants.—Several beautiful plants were noticed on the road-side in driving over the Dovrefjeld: Erigeron alpinum, Lychnis alpina, L. viscaria, Astragalus alpinus, A. glyciphyllos, Gentiana nivalis (a perfect little gem), Anemone pulsatilla, Salix herbacea, S. lanata, S. reticulata, Pedicularis lapponica, Viola biflora; also a little beauty, nestling among the under-growth, Papaver nudicaule, very handsome and growing in many-flowered tufts on the road-side and in the crevices of the rocks.

Ferns.—Ferns are quite absent from the higher fjells; I did not see even Lastrea oreopteris or Blechnum boreale. The day before the high ascent commenced I was passing through a paradise of ferns, and collected many plants of Struthiopteris germanica, Woodsia hyperborea, Botrychium lunaria, Asplenium septentrionale, &c. A large Aconitum, probably A. septentrionale, is abundant all over the country.

Whenever two large streams come together a large delta is formed by the detritus and boulders brought down during freshets. These spaces, often of large extent, are almost invariably covered with large bushes of Tamarix germanica. Speaking of detritus reminds me of the grand terrace-like masses of glacial detritus on either side of the

Gudbrandsdal ascending the Dovre, near Dombaas: entire hill-sides are composed of firm and compact masses of glistening white earth, entirely made up of the small abraded particles scraped from the rocks, such as one invariably sees discolouring the water running from the foot of a glacier. These ancient masses of ground rock have a greasy feel and fracture, which reminded me of French chalk: I am sure it might be turned to some use for polishing metals.

Drivstuen.—Here I stayed one night, and before retiring to rest went down to the Driva with my fly-rod: owing to the quantity of snow-water I could not move any decent fish, but soon filled my bag with small trout. In the farm-yard here is a deep draw-well, with the usual lever and bucket: on looking into the well, thinking of ferns, to my great surprise, I saw that, at about ten feet from the top, the sides were still encased with solid ice, a foot and a half thick: this little incident was enough to remind one of the rigorous winter experienced at this elevation.

Bjerkager.—Had some excellent trout here for supper: afterwards took my rod down to the lake, above the station, but the sides are too boggy to allow of a near enough approach. The upper end of the lake being very shallow, seemed quite alive with ducks and redshanks; the latter birds amused me much with their singular habit of perching on the tops of the spruce firs. In the evening was much delighted in listening to the song of the redwing. In the forest here I hear the hazel hen (*Tetrao bonasia*) and capercally are abundant enough in the winter time. In driving along the Gudbrandsdal, noticed the fields were in places quite purple with the beautiful Anchusa tinctoria, and in one particular place the fields were one mass of blue colour from the abundance of Dracocephalum Ruyschiana. The pine woods were deliciously scented with the beautiful Linnæa borealis.

Here I must bring these hasty notes to an end.

GEORGE NORMAN.

Hull, October 12, 1864.

Food of Quadrupeds.—As you recently requested your readers to make observations on "the life-histories" of our British sucklers (Zool. 9218), I venture to trouble you with the following notes on the food of one or two species:—

Common Shrew (Sorex tetragonurus).—I kept one of these pretty little animals for a few days in a box with moss. It would eat almost any animal substance, but seemed to prefer insects and earth-worms: the former it seized with a spring, and it would eat seven or eight house-flies at a time; if more were given it hid them in the moss. Small worms were caught by one end and munched slowly without being bitten through. On giving it a large one (about four or five inches long) it gave it a sharp bite, then sprang back, then flew at it again, until the worm was half dead, when it ate about half and hid the rest. It slept during the middle of the day, rolled up among the moss, but always waked up at once if worms or flies were put into the box. I believe that, when pressed for food, shrews will kill and eat frogs, but when a large one was placed in the box the present specimen did not seem inclined to prey upon it, although it now and then gave it a slight bite on the hind leg; after they had been together for some hours the poor frog was taken away. The shrew seemed to be very cleanly, constantly dressing its fur and "washing" its face with its fore paws, as rabbits do. It soon died by an accident. A correspondent of the 'Field' newspaper stated ('Field,' 3rd October, 1863) that the water shrew (*Crossopus fodiens*) preys on small fish, both in a state of nature and in captivity, "pursuing and capturing them with all the grace and address" of the otter. It would be interesting if any of the correspondents of the 'Zoologist,' who have the opportunity, would further investigate this habit. Here the water shrew is unknown, although I have met with one or two examples of the rarer oared shrew (*C. remifer*).

Squirrel.—In autumn and winter the squirrel often feeds on the cones of the larch and other pines: holding the cone in its fore paws it tears off the scales and devours the seeds. According to Sir C. Lyell, the remains of cones eaten in this way are found in the Norfolk cliff forest bed ('Antiquity of Man,' p. 215). Squirrels also sometimes nibble the bark of young birches, and this summer I saw one feeding on bilberries (or "blaeberries," as we call them in Scotland); it sat on its haunches among the bushes, and gathered the fruit with its fore paws. A variety with the tail almost white is not uncommon in this neighbourhood, and in some parts of Germany black ones are often seen. During a severe winter, a few years ago, a squirrel was in the habit of entering a closet on the ground-floor of this house, eating the bread, &c., which was kept there. It entered through a small unglazed window about two feet from the ground, through which it escaped if any one came in to the closet during its visit. Surely such boldness is not common in this species.

Roedeer.—I lately examined the stomachs of a buck and doe, both in fine condition. In each case the paunch was full of food, which was of a very miscellaneous description, including grass, moss, blaeberry leaves, young heather, spruce-shoots, a little corn, and, what rather surprised me, a large quantity of fragments of various species of Fungi, some being of the common kinds of "toad-stool" and others apparently of those sorts which grow on the trunks of trees. Quantities of those Fungi grow in the woods where the deer were shot.—*Edward R. Alston; Stockbriggs, Lesmahagow, N.B.; October* 14, 1864.

Seals off the Coast of Yarmouth.—The seals I noticed the occurrence of (Zool. 9277) were specimens of the common seal (*Phoca vitulina*).—*T. E. Gunn.*

Whales in the Bristol Channel.—On the 11th instant four whales were observed in Swansea Bay: two were taken and the other two got away. I was from home at the time, and on my return found all traces swept away. My brother took an outline drawing of the one which was brought in here; it seems to have been singular for the abrupt termination of the forehead, and for possessing a well-marked snout about 15 inches long: its dimensions were 27 feet in length, 20 feet in circumference, and the fan of the tail 7 feet broad. — *David Williams; 56, Wind Street, Swansea, October* 25, 1864.

Redbacked Shrike, or Butcher Bird, in Forfarshire.—Mr. Macgillivray, in his 'British Birds,' vol. iii. p. 507, states that this bird, Lanius collurio, had not, when he wrote his history, been observed in any part of Scotland. Glancing over the indices (save 1863) of the 'Zoologist,' and some other ornithological lists, I find no record of its having been yet seen or caught on the north side of the Tweed. However, be this as it may, the only Scottish specimen I have seen was one shown to me at Broomlea, Bridge of Dun, near Montrose, in July last. I have since received the following particulars of its capture from Mr. Fraser, butler to the late Mr. John Gordon, of Charleton. Mr. Fraser, who has a good eye to detect and a hand to preserve ornithological rarities, while returning directly through the fields from Montrose to Charleton in June, 1862, observed a strange bird darting frequently from a tree to the ground and back again to its perch, and was satisfied that this was the mode of its feeding. About two hours thereafter he returned with his gun, found the bird in the same tree, and secured it. Its stomach was well stuffed with small beetles.—*G. Gordon; Birnie, Elgin.*

Moulting of the Bullfinch, and Remarks on its Food, &c.—Though loose feathers were first noticed about the cage early in September, my bird had, I believe, begun its moult towards the latter days of August. Owing to an accident, the cage having fallen on the 11th of September, it lost, in fluttering about, most of its loose feathers, including many of the quills; though this may have accelerated the moult, I observed about a week later that the inner quills were then only beginning to appear, but the exterior ones were already of considerable length. The tail-feathers seem to be more rapid in growth, as the four centre ones, by the 28th of the month, had well nigh attained their full size, though some of the lateral ones were barely perceptible, and the rest but half an inch or so long; it would therefore appear that the inner quills and outer tail-feathers are not shed till the rest are of sufficient length to sustain the bird. It is a male of last year, and the breast is now assuming its rosy hue, but has not attained the brilliant colouring of the adult, nor do I think it will acquire the mature plumage for another year, though being caged may perhaps partly account for the want of brightness. The new feathers of the head and tail are more glossy, and of a purer black than the old ones, and both the upper and under tail-coverts are of a snowy whiteness. Though ruffled and drooping during the early days of its moult, it has recovered its spirits, but as yet there has been no attempt at a song, nor did I hear its plaintive note till the 11th of October. Notwithstanding its short neck and stout beak it manages to preen its feathers with great ease; indeed the nape, chin and extremities of the quills are the only parts that its bill cannot reach, but here the claws are most effective, both in scratching and combing, the head being depressed and thrown back, and the foot thrust forward between the wing and the body: this operation is often repeated, the bird seemingly taking great delight in it. When preening the feathers I observe it frequently swallow pieces of the scaly or fleshy covering of the tubes. Though Macgillivray seems to have thought it likely that they feed on insects, I fear we have no sufficient proof of this; but to make amends the bullfinch consumes an incalculable quantity of seeds of thistles and other noxious weeds: to prove this I have only to state that having collected some spear-plume thistles (*Cnicus lanceolatus*), two hundred and thirty-eight of the seeds were placed in the cage, after taking away the hemp-seed on which it had fed up to two o'clock P. M.; though the husks had to be removed, the thistle-seeds were all consumed in about twenty minutes, the bird merely stopping once or twice to cleanse its beak and slake its thirst. To show that it was by no means satiated, on the hemp-seed being replaced it began to feed again. On another occasion two hundred and seventy-five full-sized seeds of clary (*Salvia verbenaca*) were eaten in about an hour and a quarter, though it had been feeding as usual all the morning. Its frequent ablutions and fondness for water in a state of confinement may partly account for its haunt or habitat being the low secluded bushy tracts where springs abound. Having to-day narrowly inspected the plumage I think I may safely say that the moult is now completed.—*Henry Hadfield; Ventnor, Isle of Wight, October* 19, 1864.

[In reference to the food of the bullfinch, I have shown (Zool. 8699) that the young larva of Hybernia brumata, which feeds on the buds of plums and gooseberries, is the favourite food of this beautiful bird in spring, and therefore that the bird is a great benefactor to the gardener.—*Edward Newman.*]

The Hooded Crow near Moundsmere.—On the 7th instant Mr. G. Errington, of North Hall, Preston, Candover, shot a hooded crow at Bury Down, not far from Moundsmere: he kindly sent me the bird in the flesh. I had not previously met with a bird of this species in this locality, although I believe they are occasionally found here. On examining the gizzard, I found it contained several grains of barley, some small snail-shells, a great many pebbles and a quantity of half-digested matter, principally beetles.—*Anthony S. Bradby; Moundsmere, Hants, October* 27, 1864.

Hoopoes at Flamborough.—On the 21st of September, 1864, I received a note from Mr. Bailey, of Flamborough, in which he stated that on the same day he had stuffed a specimen of the hoopoe (*Upupa epops*), which had been shot by Mr. John Preston, of Flamborough, in one of his own fields. Since that date I have been informed, on good authority, that a second specimen has been captured in the same locality, but I have not yet received full details of the capture. This peculiar and foreign-looking bird has been shot several times within my own recollection in East Yorkshire, and on two occasions close to the town of Beverley.—*W. W. Boulton; Beverley, November* 1, 1864.

The Kingfisher kept as a Cage Bird.—When staying at Brecon, South Wales, a week or two ago, I went one morning to the shop of Mr. Pritchard, the well-known fishing-tackle maker and fisherman, and found there, in an ordinary bird-cage, a kingfisher, perfectly tame. Never before having seen this bird in a cage I enquired the particulars of its capture, and found that it was one of a nest of seven that were taken this spring in the neighbourhood, when partly fledged: the trouble of rearing it must have been immense. It is very healthy and in beautiful plumage. Mr. Pritchard showed me how the bird took its food; at the bottom of the cage was an ordinary saucer filled with water, into which a live minnow was put. The kingfisher, sitting on the topmost perch, eyed the fish very knowingly, and uttering its sharp, shrill cry, pounced on the fish. Mr. Pritchard then, with a twig, assisted the bird, with the fish in his mouth, to his perch, for he was unable to fly back to it without help. The bird soon "settled" the fish, by giving it two or three sharp blows against the perch, and, tossing it, swallowed it head first. I observed that, before taking its prey, the bird cast up a small white pellet, composed of small fish-bones, which crumbled to pieces when touched, like the ashes of a cigar. It strikes me that a kingfisher in a cage is a very unusual sight, and I think it may interest some of your readers to hear of it.—*Thomas Marshall; Northampton, October* 21, 1864.—*From the 'Field' Newspaper.*

Ring Dove or Wood Pigeon nesting in October.—On about the 20th of this month I observed a wood pigeon fly out of an oak tree in Inham's Coppice; the tree, I observed, was partly covered with ivy, but as I was in a hurry at the time I did not notice it particularly; next day, however, a shepherd told me that he saw the bird fly off a nest which was built amongst the ivy on the same tree. I went and climbed the tree on the 23rd, where I found a newly-made nest, in which were two fresh-laid eggs, but the old bird was not on the nest when I went to the tree, so I am afraid there will be no chance of my seeing any young birds hatched from the eggs that have evidently been laid during the last fortnight.—*Anthony S. Bradby; Moundsmere, Hants, October* 27, 1864.

Pale Variety of the Common Partridge near Beverley.—Two days ago I received, in the flesh, a peculiarly beautiful variety of the common partridge (*Perdix cinerea*). It was shot within a few miles of Beverley, and had been observed for some time. Dissection proved it to be a male bird of the year. It was marked precisely the same as an ordinary bird, but the colouring was many shades paler throughout, and inclining to a buff or creamy tint. The general effect is most pleasing and striking. Varieties of the partridge, I am aware, are not uncommon, but I have never seen so beautiful a variety as the subject of my present report.—*W. W. Boulton; Beverley, November* 1, 1864.

Young Quail near Wakefield.—A young but full-feathered quail was captured here by a gamekeeper on the 10th of October. The quail is now a rare bird in this neighbourhood.—*G. Roberts; Lofthouse, Wakefield.*

Ruff and Reeve near Beverley.—On the 25th of August, 1864, Mr. Boyes, junior, of Beverley, shot a fine immature female of this species on the River Hull, near Beverley. It was one of a small flock that had been feeding on the "Pulfin," a marshy tract of land on the bank of the River Hull. On the 7th of October, 1864, Mr. Robert Stephenson, of Beverley, shot an immature specimen of the ruff not far from the same place where Mr. Boyes shot his specimen of the reeve in the month of August. It was alone. A gamekeeper who resides near to the river states that he has not only seen, but killed and eaten, several of these birds during the past summer. He believes that they were all of them birds of the year, and says that they were in excellent condition. In former days, antecedent to drainage and improved agriculture, the ruff was of frequent occurrence in this locality. Now, however, it is so seldom seen that we class it amongst our rarest visitants.—*W. W. Boulton.*

Knot and Bartailed Godwit, in Summer Plumage, at Filey.—On the 9th of August, 1864, a beautiful male specimen of the knot (*Tringa Canutus*), in summer plumage, was shot on Filey Brigg, by Mr. Featherstone, of Filey: the bird is now in my own collection. During the early part of the month of August last a male specimen of the bartailed godwit (*Limosa rufa*) was shot near to Filey: it was one of three birds that rose from the shore, on which they had been seeking food. This bird is in summer plumage, but the breast is not uniformly rufous. I have obtained it also for my collection. The bar-tailed godwit is by no means uncommon on the Humber banks, and more particularly on the sandy flats of Spurn, at the mouth of the Humber, during the winter months. I have never before, however, met with this bird in summer plumage.—*Id.*

Is the Turnstone near Flamborough and Filey in July?—Probably it may be an error of mine that the turnstone was shot at or near Filey in July last. The history of the bird designated as the turnstone I give the readers of the 'Zoologist' and Mr. Cordeaux in particular. In the month of July, 1862, my younger son, at Weston-super-Mare, shot an exceedingly pretty bird flying among a flock of sandpipers, or "sea snipes," as they are called; it was brought to Cheltenham and stuffed very nicely by a Mr. White, of this town. The bird was of about the figure and size of the water ouzel, but with a much greater variety of plumage; it has a white breast, a pretty black ring round its neck, and the head and wings are of a brown colour. Mr. White, who "set it up," pronounced it to be a dotterell or ringnecked plover. At Filey, in July, 1864, my son shot a bird of the same species, and exactly like the one above described, but the shopkeeper, who stuffed several other birds, pronounced this one to be a real turnstone: in consequence of having an exactly similar bird at Cheltenham, I did not bring it with me. Probably Mr. White is right and Mr. Cordeaux also; to the latter gentleman I am exceedingly obliged for his observations on the Ornithology of Flamborough Cliffs. Mr. Cordeaux, on enquiry, will perhaps find that fifty years ago these cliffs were inhabited by ducks as well as cormorants; it is so stated in an old book which I read, whose date was nearly half a century back. I may be wrong about the sea-birds breeding in May, but an old inhabitant of Filey mentioned to me that, in consequence of the nests being robbed of their eggs in May, an immense number of sea-birds deserted the cliffs about the end of that month, and returned about the end of June. My thanks are also due to Mr. Dobrée for his remarks on the indefatigable porseverance of the birds in no less than thrice trying to rear their young in one summer after having their eggs destroyed.—*H. W. Newman; Hillside, Cheltenham, November* 5, 1864.

The Ruddy Shieldrake at Epworth.—Mr. Samuel Hudson has been good enough to forward me coloured sketches of the ducks, whose occurrence has been recorded by him in the 'Zoologist' (Zool. 9290) under the name of the ruddy shieldrake (*Tadorna rutila*, Pall.). Though these sketches are unfinished, it is manifest that the originals did not belong to that species, and I have little doubt, if any, that the drake was an example of the not unusual hybrid between the common wild duck (*Anas boschas*, Linn.) and the dusky duck (*Anas obscura*, Gmel.) of North America. I have in my possession at present a male specimen of this cross, which corresponds in all essential particulars with Mr. Hudson's drawing of the male bird killed at Ashby. My specimen was bred by myself at Elveden from a dusky drake, which, through Lord Lilford's kindness, I received some ten years ago from Mr. C. Domville, of Santry, near Dublin, its mother being a common wild duck. For several seasons I reared broods of these hybrids, the majority of which, being unpinioned, flew away at the ordinary time of migration. I do not wish it to be understood from what I now say that I lay any claim to the Ashby bird as being of my own breeding, for I know that several persons, the late Sir Robert Heron, for instance, have been successful in breeding the dusky duck, and it is only reasonable to suppose that the birds thus produced should have crossed with our common species, and have propagated other examples of this hybrid, which, according to M. de Selys-Longchamps (Bulletin de l'Académie Royale de Belgique, Tom. xxiii. 1856) is mentioned by Dr. Morton (Silliman's 'American Journal of Science and Arts,' March, 1847), as having been also observed in the United States. I must add that I am unable to perceive any great difference between the female bird represented in Mr. Hudson's sketch and the female of the common wild duck; this may, however, arise from the unfinished state of the drawing.—*Alfred Newton; Magdalene College, Cambridge, October* 22, 1864.

[Prior to Mr. Newton's examination of Mr. Hudson's very careful, though unfinished, drawings, they were in my possession, and I arrived at the conclusion that the male was Anas boschas, the common wild duck, in a transition state of plumage, *i. e.*, in that state which occurs twice every year, *first*, when assuming the livery of the female, and, *secondly*, when resuming the livery of the male. I failed to detect any sign of the hybridity which Mr. Newton suggests. With regard to the female, I quite concur in Mr. Newton's opinion as to its being the female of the common wild duck. Mr. Doubleday also saw the drawings, and concurred in this view of the case. I would not trouble my readers with this note had I not originated the doubt as to these birds being the ruddy shieldrake (Zool. 9121), and had not Mr. Hudson kindly sent the drawings for my opinion. I need scarcely add that neither of the drawings have any resemblance to the ruddy shieldrake, and I feel much obliged to Mr. Hudson for the pains he has taken to rectify an accidental error.—*Edward Newman.*]

Eider Duck at Filey.—Yesterday I received, in the flesh, a beautiful specimen of the eider duck (*Anas mollissima*). It is the first I have seen that has been shot on the coast of Yorkshire. The bird was a young male, a few creamy white feathers appearing on the neck, in front, and wing-coverts. It was sent me by Mr. D. Brown, of Filey, who says that it was shot on Filey Brigg the day before (November 3rd). It was accompanied by a female, which was also shot, and which I hope to secure for my collection, as well as the male bird, which is at present in the hands of Mr. Richard Richardson, of Beverley, for preservation.— *W. W. Boulton; Beverley, November* 5, 1864.

Longtailed Duck at Scilly.—A female, or immature male, specimen of this arctic duck was killed at Scilly in the past week.—*Edward Hearle Rodd; Penzance, November* 5, 1864.

The great Autumnal Migration of Birds.—The great migratory movement of our winter visitors seems to have taken place from Tuesday last to the end of the week, during the prevalence of the late easterly winds. Woodcocks, snipes, jack snipes, redwings, fieldfares and starlings have appeared in large numbers from the eastern part of the county to the Scilly Islands, and my nephew writes me word that on the 3rd instant he walked up in a short distance fifty snipes and thirty jack snipes at Trebartha, in the eastern part of the county, and that his keeper saw, in the morning dawn, woodcocks flying westward, which accounts for our market here being fully stocked on Thursday, and for the larder of the governor of the Scilly Isles having yesterday morning forty-one woodcocks hanging up.—*Id.*

Gannet at Filey.—On the 18th of August last a most perfect specimen of this bird was killed off Filey by a fisherman. It was an old male, in full plumage, and was very kindly presented to me, in the flesh, by Mr. T. Buckley, who was visiting Filey at the time of its capture. Two or three of these birds have been captured off Filey during the past summer, and one or more are generally to be met with on the East Coast of Yorkshire every year. I have an immature specimen in my collection that was taken alive by a farmer's boy in a field at Walkington, near Beverley, several years ago. This bird was kept alive by a man in Beverley, who, when he became tired of it, killed it for stuffing. The distance from the sea, at the point where it was taken, would be at least fourteen or fifteen miles, as the crow flies, but not more than seven or eight miles from the Humber. It is, I believe, very unusual to meet with the gannet so far inland. I have never before known one shot in this neighbourhood, although I have seen several cormorants (*Carbo cormoranus*) that had been shot near Beverley. Indeed three of these birds had been shot, at various intervals, actually perched on our beautiful Minster, whose lofty stone walls and towers they had probably mistaken for Nature's rocky pinnacles.—*W. W. Boulton; Beverley, November* 2, 1864.

Black Tern at Filey.—On the 3rd of September last Mr. T. Buckley shot an immature male specimen of the black tern (*Sterna nigra*) at Filey. This is a rare species on the East Coast of Yorkshire. I saw Mr. Buckley's specimen in the flesh.—*W. W. Boulton; Beverley, November* 1, 1864.

Little Gulls off Bridlington Quay.—I purchased, a few days ago, two very fine immature specimens of this rare gull from Mr. T. Jones, of Bridlington Quay. They had been shot by himself about the middle of September last. Mr. Jones tells me that he shot them close to Bridlington Quay. They were flying over the bay at the time, in company with a large number of terns. Mr. Jones also states that only a few days before he secured my two specimens he saw three of them, and shot one, which he sold to Mr. G. S. Foljambe, of Osberton, near Worksop, Nottinghamshire. He believes my birds to be those he saw on that occasion in company with the one first captured. They were flying amongst a large number of terns on both occasions.—*Id.; October* 28, 1864.

Common Skua at Flamborough Head.—On the 8th of September last Mr. Bailey, of Flamborough, sent me a fine specimen of the common skua. It had been shot by himself off the Flamborough Head, on the 7th of September. On dissection I found it was an immature female, as I had suspected from the pale colouring of the edges and tips of the feathers. This skua, although named the "common" skua (*Lestris catarractes*) is by no means a common bird on this portion of the East Coast of Yorkshire.—*Id.*

Richardson's Skuas off Bridlington Quay.—I have just received from Mr. Thomas Jones, bird-stuffer, of Bridlington Quay, two specimens of Richardson's skua (*Lestris Richardsoni*) that had been shot off that portion of the East Coast. One of these birds is in full adult plumage. Mr. Jones informs me that he shot it himself on the Quay of Bridlington, about the middle of September last. The other specimen is immature, and in the plumage of the first year. Mr. Jones does not know by whom it was shot, but he had it in the flesh, and it had been shot on the Bay of Bridlington.—*Id.; October* 22, 1864.

Buffon's Skua at Flamborough Head.—On the 8th of September last, Mr. Bailey, of Flamborough, sent me, in the flesh, a splendid specimen of this rare species. He had shot it himself off Flamborough the day before. On dissection I found it to be an immature male. The colour throughout was sooty black, with a slight shade of brown in some lights, and with the exception of the shafts of the primaries, which were pure white. Total length, from end of bill to tip of tail (*i. e.* to the end of the two central feathers, which extend several inches beyond the rest), 20 inches; wing, from the anterior bend to the end of the longest feather, 12 inches; tarsus 1½ inch; middle toe, including claw, about 1⅝ inch. Both tarsus and foot, *i. e.* toes, webs, claws and sole of foot were inky black.—*Id.; October* 28, 1864.

Fulmar Petrel near Flamborough Head.—On the 3rd instant I received, in the flesh, a fine mature specimen of the fulmar petrel (*Procellaria glacialis*). It was sent to me by Mr. D. Brown, of Filey, with the following history of its capture:—Mr. Brown states that it was killed, on the 29th of October, by Matthew Jenk, on board a fishing yawl near to Flamborough Head. On dissection I found it to be a mature male.—*Id.; November* 3, 1864.

Maigre off the Land's End.—On the 18th instant a "Sciæna" (*Couch*) or "maigre" (*Yarrell*) was taken off the Land's End. The fish was observed floating on the water, almost lifeless. A lump of sea-weed had got entangled in the gills, so that the fish could not close its gill-covers, and it was thus, in fact, drowned. It was captured by the fishermen who found it, with a gaff. It measured 5 feet 6 inches, all over, being, I believe the largest recorded British specimen. Its skin has been successfully saved, and is now in course of stuffing for the Penzance Museum. I have nothing to add to my former observations on this fish, except that, in this specimen, the membrane connecting the first and second dorsals was almost, but not altogether, obliterated, and that there was no trace of serration on the posterior edge of the preoperculum. The teeth in the gullet were most distinctly developed. I had a portion of the fish dressed, by stewing, and its flesh proved to be firm, white and flaky, but insipid, suggesting the idea that the fish was out of condition. I have now seen three specimens of this fish, and of very various sizes (5′ 6″, 4′ 6″ and 1′ 10″), and I find that, in all, the greatest depth, just under the first dorsal, is, to its length, over all, as one to five. Both Couch and Yarrell figure the fish as having a depth, to its length, of one to four, and, consequently, make it appear a stouter fish than it really is. It may be that my fish have all been out of condition, and that their figurings are correct, but the difference is worth notice.—*Thomas Cornish ; October* 25, 1864.

New British Fishes. By Thomas Edward.

The first, so far as has been, and possibly can be, ascertained, until more specimens be procured, one only as yet having been got, is considered by the best authorities whom we have on these matters to be quite a new species, and hitherto unknown. One gentleman to whom the fish was submitted for examination says he has a figure of one something similar, but a good deal larger, and not exactly the same. The only other instance where anything at all like a near approach to it can be found is in Cuvier and Valenciennes's large and beautiful work, in which there are one or two plates bearing in some measure a pretty strong resemblance. But those represented here have spinous rays on the dorsal, ventral and anal fins. Our specimen has none of these. Besides, the fishes figured by Cuvier are said to be natives of New Guinea. Now, allowing that, and admitting for the time that there is nothing impossible, still we are very much inclined to think it as hardly probable that such small things as these could ever, under any circumstances, find their way from those distant seas and be found on the coast at Banff. Nay, we believe rather that its home is on our own coast, although not previously detected. We believe, also, from what we already know, and hesitate not to say so, for sure we are that none in the least way acquainted with the wonders and inexhaustible nature of the great deep will for a single moment gainsay us, that there are yet others to be found. True, they may be, like the present, small, and on that account appear insignificant in the eyes of the community at large, but that would nevertheless neither affect nor lessen the interest of their discovery in the estimation of those who look to these things with interest. But to return: although it were the case that our fish was a native of New Guinea which had accidentally found its way here, still the want of the spinous rays of the fins already referred to, is a most important and distinctive mark, and quite sufficient of itself to prove that none of Cuvier's are, or can be, the same.

But it is not exactly agreed amongst ichthyologists whether our fish be really a mature specimen or one only approaching maturity. Although small, being scarcely an inch in length, still we must say that to us it has all the appearance of being an adult, or at least not far from that stage. We say this from the undeniable fact that it is one of the most complete and most perfectly formed creatures of the kind any one could wish to look at, every part being to all appearance fully developed, and nothing being in any way the least disproportionate, and thereby disagreeable as it were to look at. It is also of a most remarkably firm and compact texture, which is not the case with young animals generally, but more especially with those of the description now under notice, which are rather of a soft and flimsy nature, until they have at least attained some growth. In a word, it is, although in miniature, as complete a *fac simile* of perfect construction, if we may be allowed so to speak, as we ever saw, or indeed could see.

We may mention, for the sake of those more particularly interested in the matter, although we do not feel justified at present in calling the little stranger by any definite term, that it has all the characterteristics of, and does in fact belong to, the Labridæ or wrasses; but, as already hinted, whether young or old, is quite distinct from any as yet known form of that numerous and widely distributed family.

The colour when alive was of a most beautiful yellowish green, thickly marked all over, but more so on the back and head, with very minute starry specks of a purplish hue, all the fins more or less partaking of the same, save the caudal, which was whitish. The pupil of the eye appeared to be pinkish, encircled with a narrow ring of white, which glistened like burnished silver, the iris being greenish, with a tinge of bluish purple. The dorsal, which has the anterior rays for about two-thirds of its length considerably lower than the other third, extends farther back than the anal; the pectorals are fan-shaped, and placed close to the gill-openings; ventrals short and fleshy, and commencing nearly on a line with the pectorals; the anal, which commences close to the vent, has all the rays nearly of equal length; caudal or tail somewhat pointed. The head is rather obtuse, with the lips somewhat fleshy, which, as is well known to the ichthyologist, is common to the tribe.

Although we cannot say much of importance concerning the traits of our little friend, still there is one which we cannot pass over in silence. It is this. On coming out of the water after we took our prize we had occasion to lay it down on the sand until a bottle was prepared for its reception and exclusive use, as we were very anxious to get it home alive, so that we might see and learn as much of its habits as possible. Whilst thus employed we were rather surprised at seeing it leap frequently several inches at a time. Thinking that the damp sand might have in some way or other aided the operation, we placed it on a dry board when we got home to see how it would or could perform there. It did just the same. Away it jumped, jump after jump, until we were fully satisfied that there was no difference as to place, and put him again into his little aquarium. We now observed, however, that the tail, which is pretty large, was the chief and most important object used. The head and shoulders were first raised a little, and then, by a doubling of the tail, which acted as a kind of spring, the animal was, by a slight jerk, enabled to rise and propel itself forward, or to either side, and not unfrequently right over. In the water, too, when twitted with anything, instead of swimming away as fish generally do, it merely leaped or jerked to one side in order to avoid the annoyance. We are not exactly aware whether this gymnastic performance be a common propensity with this family of fishes or not, but so it was with this specimen.

The other species alluded to, also a small one, belongs to quite a different order, that of Malacopterygii Subbrachiati; and if not equally new the only other place where it has as yet been found is on the Irish coast, where something similar is said to have been obtained by a Mr. Thomson. But there is a difference of opinion, some considering the Irish fish and the species found here to be quite distinct, and in this we ourselves are inclined to concur. We have never seen Mr. Thomson's, nor yet had the good fortune to see a plate or to meet with any published notice of it; but the following extract from a letter we had from Mr. Couch, the well-known ichthyologist, to whom we sent one of ours for his opinion, will speak for itself:—

"Polperro, May 26, 1863.

"Dear Sir,—Believing you will be somewhat anxious to receive some account of your little fish, I write you now after a full day's examination of it, preferring to do so rather than wait to the time I may return it, which probably will not be for a week or so. The only account, so far as I know, of anything like it is in the fourth volume of Thomson's 'Natural History of Ireland,' where he describes one something similar, but supposes it to be the same as my 'mackerel midge.' From an attentive examination, however, of your specimen I am persuaded that this is a different fish, and consequently that yours is a new species, and even a new genus. It is true Thomson describes his as having the ventral fins in front of the pectorals, which is very different from what appears in yours; nor can I detect any ciliated membrane at the beginning of the back, nor yet any barbules in yours as in his. Thomson's fish also appears to be larger than yours. I do however, think they are the same, and shall introduce them as such in my 'Fishes,' with a figure which I have taken from your specimen, and under the name of Thomson's midge (*Couchia Thomsoni*).—Yours &c., J. COUCH."

From the foregoing it will be at once apparent to all in any way acquainted with these things that there is a decided and marked difference betwixt the two fishes here alluded to, but whether generic or a wrong description given by Thomson, remains to be seen. This we know, that as soon as the news of the discovery here reached the scientific world several individuals sent soliciting examples of what they were pleased to term the "new fish," and, amongst others, Dr. Gray, of London, sent for some specimens for the Home Department of the British Museum.

It was only in April of last year that these fishes were first detected here, and were observed to remain only a few weeks, when they again disappeared, and nothing more was seen of them till May this year. This time they only remained a few days, but reappeared again towards the end of August, and continued until the second week of the present month (September). As this was a lucky chance, and one not to lose, we took a considerable number, not with the intent of destroying the beautiful little creatures, as beautiful they truly are, but for the purpose of ascertaining how they now stood as to size. Having satisfied ourselves in this, we committed the most of them again to their native element, and right glad they appeared to be on being once more set at liberty. From this examination we found that, although late in the season, they had in no way increased in bulk, as compared with those we took in the spring. From this most important and most opportune circumstance, too, it is now our firm and decided belief that their average length does not exceed an inch. We have taken specimens a little larger. It would seem that they are a deep water fish, and, herring-like, only visit the shore occasionally. Like that fish, too, they are gregarious, that is they go in small shoals, and, if we are allowed to speak from experience and from what we have seen, we must say that they are the fleetest, most active and most vigilant of all the finny tribes. Should any one be inclined to doubt this, they will perhaps give us a little more credit when we tell them that, besides what we observed in the sea itself, we kept a number of them alive beside us for some time, placed in the window before which we worked, so that we had the pleasure of observing their habits at our leisure, that is, so far as anything of that kind can be done within a limited compass, and were well repaid for our time and patience.

Our little fish has the back of a pea-green colour, diversified with numerous and very minute roundish spots, or rather specks, of a darker colour; sides and belly of a pure silvery white, and having a bright metallic lustre. The fins also are mostly white, save a portion of the pectoral at its base, which is of a greenish yellow, and a part of the ventral, which at its extremity is black. The head is short, flat above, and slightly compressed. The eye, which is large, partakes in a great measure of the colours of the fish itself, with this addition,—that in certain lights it has the appearance of having a tinge or shade of a purplish green, red and blue. The dorsal, which commences a little in advance of the end of the pectoral, stretches, along with the anal, to within a very little of the caudal, both ending on a line. The pectoral is broad, narrowing towards its tip, and, with the ventral, commences close to the head, and almost close to each other. This last fin, the ventral, is a most remarkable and peculiar one, being very long and narrow, equalling nearly half the length of the animal; when closed reaching beyond the vent, and consequently beyond the commencement of the anal. The caudal or tail fin is rather square. The lateral line, which consists of a slight depression, is straight. As to barbules or any cirrosities, we can see none.

Had the chin fin been here, the ventral been placed on the side, and the side fin, the pectoral, where it is, we would have had as fine a picture as possibly could have been of a flying fish in miniature. The semblance between that genus and this little thing, save the position of these two fins, is remarkable; at least it struck us as being so when we first met with it, and we think so still.

We would here express our opinion, from some slight differences which we can perceive betwixt the true wrasses and our fish, that it may yet be deemed necessary, from future investigation, to place it in a new or sub genus. In that case a part of the name would of course require to be changed; but until that takes place, if it ever does happen, we hold it as Labrus microscopicus, or the microscopical wrasse of the Moray Firth.

THOMAS EDWARD.

On the Occurrence of Pieris Rapæ in Canada. By G. J. BOWLES, Sec. Ent. Soc. of Canada, Quebec Branch.

DURING the summer of 1863, my first collecting season, I captured in the vicinity of Quebec numerous specimens of a butterfly of which no description could be found in any work on American Entomology. Mr. Couper, to whom I applied for assistance, was equally at a loss to determine the species, considering it, as I did, to be indigenous to Canada. In order to solve the problem, however, he forwarded some specimens of the imago to Mr. William Saunders, of London, C.W., who pronounced them to be identical with Pieris Rapæ, the small white butterfly of England, one of the most common and injurious lepidopterous insects of that country. In the mean time I had enclosed a drawing of the butterfly, together with the wings, to Mr. S. H. Scudder, of Boston, Mass., from whom I received a reply, stating that, after comparing the drawing and wings with specimens of P. Rapæ in the Museum of Comparative Zoology at Cambridge, he saw no reason to consider them distinct; at the same time he desired further investigation to be made respecting the larva and pupa states of the insect. This investigation has been successfully carried out, and places beyond doubt the identity of the butterfly with the English P. Rapæ, thus establishing another instance of the transportation of a lepidopterous insect across a wide expanse of ocean, and its naturalization in a new country,—an instance which, when the evidence is considered, must be regarded as the most conclusive on record.

The identity of the English and Canadian species is thus proved by the exact similarity of the two insects in all their stages. That the imagines are alike in both sexes, I have on the authority of the gentlemen above named; for in Quebec I could have no opportunity of comparing specimens taken in both countries. It is singular, too, that a curious variety of the male is common to both; in Canada, however (perhaps from the effect of a different climate), it is more frequently met with than in England. Two males of a bright canary colour, but with the usual markings of the species, were captured here last summer, one by Mr. Couper, the other by me; and this season I have already seen several similar individuals. On referring to a valuable work in the library of Parliament (Curtis's 'Farm Insects'), I was gratified to find that the author mentions having in his collection a male P. Rapæ, "taken near Oldham, in Lancashire, which had all the wings of a bright yellow colour." As to the pupa, in size, colour and markings, it exactly agrees with engravings and descriptions of the English chrysalis, and also in its usual place of deposition, &c. The last link in the chain is furnished by the similarity of the caterpillar, which also agrees with the best English descriptions. I took several of these larvæ from cabbage-plants in hot-beds on the 8th of June, and have reared four of them to maturity. When about half-grown they began to exhibit the characteristic markings of the species, these markings becoming more decided as they increased in size.

That this insect is not native to Canada is certain from two interesting circumstances connected with its history. A limit can be set to its existence in Canada, and the place where it first appeared can be specified. Until within a few years the butterfly was unknown in this country. No description of it is found in Kirby's 'Fauna Boreali-Americana,' nor in 'The Canadian Naturalist,' by Gosse, who visited Quebec, and collected here about 1839. The 'Synopsis' of the Smithsonian Institution is also wanting in this respect; and I have carefully examined the volumes of our Magazine of Natural History ('The Canadian Naturalist,' Montreal), without finding any notice of the species. This periodical contains two lists of Lepidoptera collected in Lower Canada; one by Mr. R. Bell, jun., of butterflies taken on the Lower St. Lawrence; the other by Mr. D'Urban, of those found in the vicinity of Montreal, in 1857, 1858 and 1859. The only Pieris mentioned in these lists is P. oleracea, a species which may be distinguished at a glance from P. Rapæ, the markings being altogether different. Mr. Couper captured a specimen of P. Rapæ within the city limits of Quebec, about five years ago, but did not investigate the subject, though considering the insect a rare one, his special study being Coleoptera. This is the earliest notice of the butterfly in Canada; and it evidently points out Quebec as the locality of introduction, and fixes the period at about seven or eight years ago.

With respect to the means by which it has been brought into the country, some plausible conjectures may be advanced. Of course the introduction took place during the season of navigation. The turnip, cabbage and other kindred vegetables constitute the principal food-plants of the insect; and, adhering to one of these, it must have been carried across the ocean, either in the egg, larva or chrysalis; the last being the most unlikely, as the larva always forsakes its food-plant, and becomes a pupa in some sheltered situation, usually under the coping of a wall, &c. The eggs are laid on the under side of cabbage and turnip leaves, where the larvæ, on emerging, find themselves in close proximity to their food. Perhaps the vegetable refuse thrown from one of our ocean steamers on her arrival has contained a few eggs or larvæ, which, under these unfavourable circumstances, have retained their vitality; and from those have sprung the imagines destined to become the parents of the species in Canada. The habitat of the insect is still very limited. After making inquiry, I do not think it has extended more than forty miles from Quebec as a centre, so that a circle of eighty miles diameter would include the present habitat. This may seem great progress during the short period of its naturalization, but, considering the fecundity and habits of the species, it is not surprising.

There is some importance connected with the introduction of this butterfly, apart from the scientific interest of the subject to entomologists. Hitherto Lower Canada has possessed but one species of the genus Pieris (P. oleracea, *Harris*, Pontia casta, *Kirby*), and this species so insignificant in numbers, at least in the Quebec region, that its depredations have passed unnoticed. The new importation, however, must be regarded in a different light. As the insect is now permanently settled in the country, is very prolific, and the larvæ extremely voracious, we may anticipate its becoming a great pest to farmers and gardeners, not only where it is now found, but ultimately in the whole of Canada and parts of the United States. And that it will, in the course of time, spread over these regions admits of no doubt. The food-plants of the species are cultivated in every part of the country, and besides the insect has the power of accommodating itself to altered circumstances. Mr. Curtis, in the work before mentioned, states that the caterpillars have been found feeding on the willow, and on mignionette, nasturtiums, &c. It is, therefore, probable that its progress westward will not be impeded by the scarcity of its favourite food in certain localities, but that it will overcome all difficulties of this nature by resorting to other plants, not confining itself to the Cruciferæ.

Last autumn, in the vicinity of Quebec, the ravages of these larvæ were very great. Large plots and even fields of cabbages, cauliflowers, &c., were completely destroyed, the caterpillars only rejecting the strong supporting ribs of the leaves. Serious loss was thus occasioned to market gardeners and others. One informed me that he had sustained a loss of more than 200 dollars by their depredations; another that nearly the whole of his crop of cabbages was destroyed, the small portion saved requiring to be carefully washed before being sent to market. A gentleman also told me that they had not only eaten up his garden produce, but had demolished a bed of mignionette, even to the stalks.

Nature has provided more than one means of checking the increase of the species. The chrysalis is attacked by a parasite (probably one of the Ichneumonidæ), as several collected by me this spring gave evidence. Large numbers of the pupæ are also killed by the frost, where they have been placed in exposed situations, and thus the spring brood of butterflies is materially lessened. I noticed a singular circumstance connected with these winter pupæ. Living chrysalids, brought into the warm house from the cold outside, invariably shrivelled and died in a few days. Out of many that I gathered during last winter not one produced a butterfly.

Last year the species was exceedingly abundant in the neighbourhood of Quebec, flying by hundreds over the fields and gardens, and even in the most crowded parts of the city; and this season it promises to be equally numerous. Early in March, the butterflies began to appear in houses, from pupæ which had been suspended on the walls during the previous autumn. On the 6th of April, at Laval, about fifteen miles from Quebec, several specimens were taken in the open air, and on the 26th of May I counted more than fifty individuals, met with on about a mile of road within a short distance of the city.

Considering their great abundance within their present habitat, and their prospective dissemination over the province, it is desirable that information respecting the appearance and habits of these insects should be given to the public, and means devised for their destruction. Farmers and gardeners should kill every caterpillar on their turnips, cabbages, &c., and be provided with nets to capture the perfect insects. The chrysalids should also be sought for on fences during the fall and winter, and destroyed. Unless these precautions be taken, the injury caused by this butterfly to the green crops in Canada may become very serious.*

* From 'The Canadian Naturalist,' New Series, Vol. i. No. 4, p. 258.

[There is something as unusual as it is praiseworthy in the manner in which Mr. Bowles has worked out this interesting subject: I lay no stress whatever on the theory suggested for the introduction of the species; nor do I regard, as worth much consideration, the fears expressed as to its increase to any injurious extent, since that has never been the case in this country; neither has its congener, Pieris Napi, ever ventured much beyond its natural food-plant, the water cress, and has never, to my knowledge, touched any of our cabbages. The interest attached to this paper is of a purely scientific character: we see an immense region in which the species is unknown; we see the species accidentally introduced, at first appearing sparingly, then increasing gradually, then rapidly, and eventually becoming so abundant as to excite fears for the crops. This, of course, suggests the idea of other introductions. That a species should have two or more centres from whence it originally diffused itself is highly improbable, unless it were assisted by some human agency. We have several species which present this *primâ facie* improbability; for instance, Vanessa Antiopa, V. Atalanta, Cynthia Cardui, Bombylius medius, B. minor, Allantus ater, Bombus Sylvarum, B. terrestris, &c., and the carefully elaborated history of Pieris Rapæ (now before us) certainly suggests the idea that all these may be also colonists, although colonists of an earlier date: the subject is one which requires and deserves the most careful investigation. It is a well-known fact that some plants, as well as insects, are cosmopolitan, and as the former are certainly in course of introduction into new localities, it is by no means improbable that insects accompany or follow their introduction. If this be so, we have as feasible an explanation of the presence of Pieris Rapæ and Vanessa Antiopa in Canada as of our commonest weeds in New Zealand and at Adelaide.

A second question of no less interest arises out of the first. Does any perceptible difference exist between the European and Canadian individuals? and if so, does the difference increase or diminish? The bearing of these questions is obvious; if a difference is originated and continued when a European species establishes itself in America, or an American species in Europe, and becomes something different from its progenitors, we have a first step towards the establishment of a new species; the value of the differences will be in accordance with their constancy rather than their amount.—*Edwdrd Newman.*]

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

November 7, 1864.—F. P. PASCOE, Esq., President, in the Chair.

Presentation to W. W. Saunders, Esq.

Prior to the scientific business of the Meeting, a handsome silver vase was presented by the President, on behalf of numerous Members of the Society, to W. Wilson Saunders, Esq., F.R.S., &c., in acknowledgment of the generous aid which for years he has bestowed upon everything tending to advance the Science of Entomology, and in recognition of his unvarying kindness and the constant and liberal support which he has given to the Society.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'The Journal of the Royal Agricultural Society,' Vol. xxv. Part ii.; presented by the Society. 'Mémoire sur le Pou à poche blanche;' by the Author, M. E. Icery, D.M.C.P. 'Corynodinorum Recensio;' by the Author, the Rev. T. A. Marshall, F.L.S. 'The Zoologist' and 'The Entomologist' for November; by the Editor. 'The Entomologist's Monthly Magazine,' No. 6; by the Editors. 'The Journal of the Society of Arts' for October; by the Society. 'The Reader' for October; by the Editor. 'The Athenæum' for October; by the Editor. 'Stettiner Entomologische Zeitung,' Vol. 25, Nos. 10—12; by the Entomological Society of Stettin. 'Amtlicher Bericht über die 38ste Versammlung deutscher Naturforscher in Stettin im September, 1863;' by Dr. C. A. Dohrn. 'Report of the Commission appointed to enquire into the causes of decay in Wood Carvings, and the means of preventing and remedying the effects of such decay;' by Professor Westwood.

Exhibitions, &c.

Mr. Janson exhibited four species of Coleoptera belonging to Mr. Joseph Sidebotham, of Manchester, and all new to the British list. They were (1) Ceuthorhynchideus Poweri, *Rye*; two specimens taken by Mr. Sidebotham in Silverdale, near Lancaster, between the 14th and 18th of May, 1864, most probably by sweeping on the borders of the woods near the shore; (2) Lixus filiformis, *Fabr.*; a single specimen (at first taken for L. bicolor) captured by Mr. Sidebotham by beating the oak or birch in a wood on the side of Roundney Hill, near Devizes, early in June, 1864; (3) Sybines canus, *Herbst*; two specimens taken by Mr. Sidebotham, by sweeping, in a lane between Devizes and Pottern, early in June, 1864; (4) Peritelus griseus, *Oliv.*; several specimens were collected at Ventnor in April, 1864, by Mr. Wainwright, probably by shaking herbage upon a sheet of paper, in which manner some bottles full of Coleoptera had been obtained by that gentleman.

Mr. F. Smith exhibited three males and a female of a Bombus new to Britain, the Bombus pomorum of Panzer: the males were captured some years ago, and had been placed in his collection as a variety of another species; the female was the specimen exhibited at the Meeting in June last (*ante* p. 26), and was captured at Deal.

Mr. Edwin Shepherd (on behalf of Mr. S. Carter, of Manchester, who was present as a visitor), exhibited three males and a female of Sesia spheciformis, *W.V.*, bred from pupæ found in the stems of alder-trees in the north of Staffordshire.

Mr. W. W. Saunders exhibited some galls which he had found in making an excavation at the foot of an oak about a month previously; the galls were attached to the root of the tree, but were not in clusters, and were at a depth of four feet below the surface; each gall contained two or three larvæ, and during the last few days five specimens of the perfect insect had gnawed their way out; at first a very small hole was visible, through which, when it had been made large enough, a mandible was pushed; the insect continued its gnawing, an antenna was soon protruded, and gradually a perfect Cynips emerged. The whole of the five specimens were females, and he believed that the whole brood would prove to be of that sex. These phenomena suggested several queries not capable of easy answer: in the first place, how does the Cynips make its way to the surface through the four feet of sand or earth which lies above it? Secondly, how does the parent manage to lay her eggs so deep in the ground? Thirdly, how long are the galls in process of formation? Fourthly, it would seem highly probable, from the observations of foreign entomologists on allied species, that in Cynips aptera (to which the exhibited specimens were very nearly related if not identical therewith) the male comes out in the spring, and in the spring only, whereas here was a brood of females emerging in October. Another peculiar circumstance was that the flies, since their escape from the galls, had made, in the box in which they were confined, a web of considerable tenacity, not unlike that formed by the larvæ of certain Lepidoptera.

Mr. F. Smith considered the specimens exhibited to be the Cynips aptera: in Bishop's Wood the galls might be obtained in any quantity, and he had himself reared hundreds of the fly, but all the specimens were females; he had collected them at all times of the year, and never saw a male: so far as he was aware, a male Cynips (*i.e.* of the true genus Cynips of Hartig) had never been observed.

Professor Westwood said that the males of Cynips were described by American authors; the occurrence of an autumn brood consisting of females only had also been noticed, and to the phenomenon of one sex in one brood and the other in another the term "dimorphism" had been applied. The spring brood, however, was said to yield both males and females; the theory was that the females of the autumn brood were agamous, but laid eggs,—that it was a case of parthenogenesis,—but that those of the spring brood were fertilized in the ordinary manner by contact with the male.

Mr. W. W. Saunders exhibited three other kinds of gall which he had found during a recent trip to Switzerland. The first was found on a glaucous-leaved willow, and occurred near the Lake of Brienz: it resembled a small fir-cone, or might even be likened to the flower of a Centaurea: no larvæ were discovered, but traces of their action were visible, and the cause of the excrescences was doubtless a Cynips. The second kind was found in July near Coire, where a dwarf and stunted species of willow was covered with red berries, looking like so many red currants; these also were doubtless due to a Cynips. The third kind was formed on the beech, and was an indurated conical gall, so hard as with difficulty to be cut with a knife, but nevertheless made on the leaf of the tree; it was hollow, with a large flat base in which the larva nestled, and was found at Ragatz and at Interlaken, and in other parts of Switzerland, in July and August.

Mr. Stainton exhibited a gall found on the oak near Bath, the exterior of which was of a woolly texture and of yellowish colour.

Mr. Stainton also exhibited copies of the twenty-one plates designed to illustrate Messrs. Douglas and Scott's forthcoming volume on the British Hemiptera-Heteroptera.

Mr. F. Smith (after mentioning that in a previous letter Mr. Stone had informed him that he had noticed a number of workers of the common wasp busily engaged in carrying young grubs out of the nest) read the following extracts from a letter addressed to him on the 4th of November, 1864, by Mr. Stone:—

"You ask why were the workers of Vespa vulgaris carrying out the young grubs? I have no doubt whatever that it was in consequence of the grubs having become from some cause or other in a diseased and sickly state; they appeared to be carried to a distance and then dropped, just as is the case at the close of the season when the communities break up. There was a nest of Vespa Germanica close by, and my first impression was that it was by the workers from this nest that the grubs of V. vulgaris were being removed, in order to feed their own larvæ upon them; but having caught several as they emerged, each laden with a grub, I found that that was not the case, but that they were unquestionably the legitimate occupiers of the nest at which they were captured. This nest became a ruin before the end of August, and that of V. Germanica shortly afterwards, thus proving that disease of some kind had attacked both communities.

"Of the sixteen nests of Vespa sylvestris which I obtained, one was situated in the thatch of an out-house, one was suspended from the roof of a temple dedicated to a certain goddess who shall be nameless, one was suspended just inside a rabbit burrow, and the rest were built in a variety of holes in the ground, mostly in banks by the side of ditches or streams of water; several were in holes I had myself formed in banks. Whatever hole they may select they invariably place their nest nearer to the entrance than the other species of underground wasps. In the majority of cases which have come under my observation the nest has in fact been exposed to view, without the trouble of digging for it.

"On opening some closed-up cells appropriated to queens or females in a nest of Vespa vulgaris, I found one larva and one pupa differing in nothing that I could perceive from those of Ripiphorus contained in the cells appropriated to workers, except that they were something like double the size, in fact about as much larger as a full-grown larva of a queen-wasp is larger than that of a worker. Are there two species of Ripiphorus, or a large and a small variety? or if only one, would the large specimens above-mentioned (which I have preserved in spirits) produce Ripiphorus as it ought to be, and are those found in the cells of worker-wasps only starved examples of the beetle?"

Professor Westwood replied that there was but one species of Ripiphorus, the well-known R. paradoxus; there was, however, considerable difference in the size of the sexes, and it would be a singular result if it should turn out that female wasps produced female Ripiphori, whilst the workers produced the males. Since the different food supplied to wasp-larvæ determined whether they should become females or workers, it seemed not impossible that the sex of the parasitic Ripiphorus should depend upon whether its larva fed on queen-larva or worker-larva. With respect to the disease amongst wasps mentioned by Mr. Stone, it was probably akin to the disease amongst bees known as "foul brood:" the cause of this malady was unknown, some supposing that it was attributable to the brood having become chilled, others regarding it as a sort of cholera. But whatever the cause, there was no doubt as to the malignity of the disease: if a hive once became infected, it attacked the honey therein, and bees fed on that honey during the winter became also diseased. The hives of so experienced a bee-keeper as Mr. Woodbury were not free from this plague.

The Secretary observed that it might not be uninteresting to the Society to hear from time to time of the welfare of the various provincial Societies which had been founded with an object identical or cognate with our own. He had recently had the pleasure of assisting at the opening of an Exhibition of Objects of Natural History, held under the auspices of the Huddersfield Naturalists' Society. Mammals, birds and their nests and eggs, reptiles, fishes, mollusks, insects, herbaria and geological specimens, were contributed by upwards of sixty local exhibitors, the majority of whom were persons gaining their livelihood by manual labour. The stuffed birds formed perhaps the most prominent feature. The insects consisted of eight cases of Coleoptera belonging to four exhibitors, seventy cases of Lepidoptera belonging to ten exhibitors, and ten cases of miscellaneous insects belonging to seven exhibitors; nearly all were indigenous species; one or two curious hermaphrodites were shown (a very complete one of Liparis dispar), and several of the cases contained singularly beautiful varieties of Arctia Caja, Abraxas Grossulariata, and others of the commoner Lepidoptera, which varieties had for the most part been bred by the exhibitors, from the larva. He was informed that the exhibition had been visited by hundreds daily, and had proved a success both financially and otherwise.

Mr. C. A. Wilson, Corresponding Member, under date of Adelaide, August 26, 1864, sent the following:—

Notes on South-Australian Entomology.

"The following is a statement of the comparative number of species of each order of insects found in the Colony of South Australia, and also of the principal families of Coleoptera. Additional species will be continually found in parts which are now for the first time becoming occupied. We are pressing forward both on the eastern and western sides of this continent. By public and private enterprise the country north of Champion Bay is now in the act of being made known. With the aid of the Queensland Government, that to the north of Rockhampton on the north-east coast, up to Rockingham, is also being colonized. Still further on the northernmost part, or C .pe York, shooting far away towards the equator, a settlement is being formed by parties from England. And, lastly, by our own Government, the north-west coast near Arnheim's Land is now being surveyed for future occupation, in the neighbourhood of the spot where Stuart's small but adventurous band first saw the ocean after their passage through the till-then-unknown interior from Adelaide. This will still leave almost entirely untrodden the vast tract of country between Arnheim's Land and the Queensland territory, passing by the south shores of the Gulf of Carpentaria, in returning from which the lamented Burke and his party lost their lives; also the equally untried country between the boundaries of our province and that of Western Australia, the northern and central parts of which will probably long remain a sealed book, though the time doubtless *will* come when the unknown shall be so no longer either to the explorer or the naturalist.

"What all these vast tracts will present to us of animal life, in addition to what is already known, it is of course impossible to say, though pleasant to speculate upon. Already from the neighbourhood of the Darling River, north-east of Adelaide, and from Western Australia, various small and quite new species of the Marsupialia are being forwarded to the Curator of our Museum, and new birds, reptiles and insects will follow.

"In a rough but carefully-weighed estimate, after an acquaintance of many years with the insects of this colony, I have come to the following conclusions. Taking the number 20 for the Coleoptera, which have more admirers and have been more carefully collected hitherto than any other order, the relative value of the seven principal orders of insects in South Australia is as under:—

	Relative number of species.
Coleoptera	20
Hymenoptera	11½
Lepidoptera	6½
Diptera	4½
Hemiptera and Heteroptera	2
Orthoptera	1
Neuroptera	½

"The remaining orders, Thysanoptera, Aphaniptera, &c., have as yet yielded so few species (of Strepsiptera, I believe, no species has yet been found) that I do not notice them here. The number of the Coleoptera would be more nearly attained by each of the three orders which immediately follow, if the latter were more looked after, as in a few of the families of each there are hundreds of minute insects. In the list just given, the Hymenoptera are principally supported by the families Ichneumonidæ and Apidæ; the Lepidoptera by the numerous small moths; the Diptera by the Muscidæ; the Homoptera by the Cercopidæ; and the Orthoptera by the Locustidæ. With the exception of the last, this seems much the same as in European countries.

"The collections of Coleoptera in the Adelaide Museum, in Mr. F. G. Waterhouse's private cabinets, and my own, include by far the greatest number of known South-Australian species. These, with several other small collections, give the following as (in round numbers) the now-known species of Coleoptera and of the seven most numerous families:—

Total number of South-Australian Coleoptera, (say) 5000 species.

These in a few years will probably be nearly doubled.

Principal Families.	Number in Collections.
Curculionidæ	About 600 species.
Chrysomelidæ	" 450 "
Buprestidæ	" 300 "
Cerambycidæ	" 250 "
Carabidæ	" 200 "
Melolonthidæ	" 100 "
Helopidæ	" 100 "
	2000"

The Secretary, after mentioning that the subject of Dr. Icéry's 'Mémoire sur le Pou à poche blanche' (of which a presentation copy was on the table) was identical with the sugar-cane-infesting Coccus of which specimens were exhibited at the June Meeting of the Society, read a translation of the 'Mémoire.' The following are abridged extracts therefrom:—

"*The Eggs and the Larvæ.*—When the insect, improperly called a 'louse,' is examined on the plant where it has fixed itself, two distinct parts may be remarked, different in consistency and in colour; one, somewhat flattened transversely, of oval form and of a brown shade, is the insect itself; the other, rounded, formed of a sort of silk or white wool, constitutes the envelope of the pouch which secretes a considerable quantity of very small yellowish grains, adhering together by means of a filamentous substance similar to that which forms the envelope of the pouch. This substance, to which a sugary taste has been attributed, seems, on the contrary, to be very irritating; placed on the mucous membranes it excites a violent inflammation. The small yellowish grains are the eggs, the number of which is variable, according to the more or less favourable conditions attending their production. They are of oval shape and ·28 of a millimètre in their longer diameter. The mean quantity found in a pouch cannot be estimated at less than 100 to 125. The hatching of the eggs begins at the periphery of the pouch, the circumference of which is soon afterwards torn by the first larvæ which appear. The gnawing of the pouch by ants, which are greedy in pursuit of it, rapidly effects the exit of the young 'lice' and their dispersion over the surrounding parts. It is only at the end of several days that all the larvæ have burst through the filamentous matter, and abandoned the pouch which sheltered them. At this time, the mother is almost dried up and looks like a brownish scale. At the moment of detaching itself, the larva is still surrounded by a film of the filamentous substance, which by its lightness and the surface which it opposes to the breeze easily explains the carriage of the insect for great distances by means of currents of air. Its oblong body is from front to back ·4 millimètres in length; with three pairs of long and slender feet, the tarsus of which is formed of five joints, and ends in a sort of claw which issues from between two long hairs. The abdomen at the posterior and median part has a deep slit, which passes beyond two small tubercles, on which are implanted two long filaments directed horizontally backwards, and which have a slight curvature. The head has on either side a round and prominent eye, and is armed with two long antennæ bristling with short and slender hairs. This larva is scarcely perceptible to the naked eye; it requires a strong lens to see it distinctly. As soon as it leaves its mother's pouch, it seeks a place suitable for fixing itself. It is curious to see the activity which these small animals then display; as quick in their movements as ants, they run from side to side, and spread themselves over the neighbouring leaves, which they seem to study with care until they meet with the wished-for conditions for establishing their new abode.

"One remarkable circumstance peculiar to this insect is, that instead of improving as it is developed, as takes place for the most part with other larvæ, it on the contrary gradually loses its primitive qualities, and at the end of some days transforms itself in a manner not easy to be known again. Its tail and antennæ fall off, its feet waste away, its head becomes less distinct, its body grows round; and soon, incapable of performing the slightest motion, it presents itself under the guise of a small whitish and transparent body adhering closely to the leaf on which it has fastened itself. This transformation, at one time slow, at another rapid, is dependent on the greater or less facility which the larva meets with in finding a favourable locality, the object of its active search. Thus withered leaves, exposure of the plant to a current of air, are causes which retard the transformation; whilst a suitable exposure, tender and green leaves, on the contrary, have the effect of making it more rapid. But, in any case, it is only at the end of several days that the larva begins to undergo the modifications of which we have just spoken.

"Another particularity worthy of remark, and which is of paramount interest to us, is the resistance which this larva offers to the ordinary means of destruction likely to reach it. I have plunged it in water for twenty to thirty minutes, and at different times, without being able to kill it. As soon as it had freed itself from all moisture it resumed its habitual mode of procedure, and seemed to have lost none of its agility. And what is astonishing, acetic acid (concentrated vinegar) and ammoniac acid are equally powerless over it. Alcohol, on the contrary, acts on the insect with fatal promptness. To kill it, it is sufficient to touch it with the tip of a point which carries a small drop of spirits of wine. This property might be made use of in opposing the insect, by employing, to wet the leaves of the young canes which are attacked, the fermented liquids which it is so easy to obtain in every manufactory. Strongly odoriferous substances and oil of naphtha, mixed in small quantities with liquids of inferior quality, may also be utilized in the same manner, and render excellent service. The sulphurous solution, which is obtained when a mixture of sulphur and lime is boiled in water, would likewise produce a favourable result in destroying the 'louse,' if it were applied on a large scale. These are different substances, all injurious to the insect, capable of easy employment, and to which it is sufficient for me to call attention.

"I was unwilling to speak of the larva without indicating summarily the means which have appeared to me the most suitable for opposing it; because it is at this period of its existence that it can be profitably and easily got at; later on, the remedy will have lost its chief quality, that of preventing the adherence of the insect to the leaf, and the mischief will have already been done.

"*The Female.*—The female is the 'white-pouched louse,' in the most general and common acceptation of the term; it is she, in fact, that has been so designated, and it is she only with which the planters are acquainted. She appears ar first on the leaves of the sugar-cane like a white dot, of a size and transparency such that she escapes a rapid examination, even by persons accustomed to recognise her. The hinder half of the body is surrounded by a white circle formed by the secretion of the filamentous wool which always precedes oviposition and accumulates as the eggs are laid.

"Three weeks are generally sufficient for the accomplishment of the laying of the eggs. The hatching soon follows; and the young 'lice,' before quitting their nest for good, often return under the roof offered them by their mother, whose body, even after death, still shelters and protects them. The feet of the female insect disappear or wither away, and later on dry up in contact with the abdomen, where they may be found for a long time in the form of yellow and tough fragments. No trace exists of the antennæ and tail, and the eggs are indicated only by two very small black dots placed on either side the head, which merges in the body. The general form of the insect is then elliptic, flattened on the abdominal side, and projecting from front to rear on the median dorsal line. At its circumference the body, except in the rear, where there is a deep slit, is thin and armed with filaments which serve to make it adhere firmly to the leaf of the plant. In front these filamentous appendages, to the number of four or five, often acquire a considerable length, and are doubtless designed to facilitate suction. The mouth is a snout (*une trompe*), which extends beyond the head and bends downwards; I have not been able to analyse the different elements of which this snout is formed. The digestive tube, which runs from the mouth, ends in front of the posterior abdominal slit in a sort of *cloaca*, a vast cavity which affords an outlet for the excrementatious matters and the eggs. The abdomen is covered with transverse folds, which become very manifest, and execute concentric intermittent movements during the whole duration of the egg-laying. The whole abdominal tegument is furnished with glandular follicles, designed for the secretion of the white matter; that of the back is, on the contrary, perfectly smooth. On each side of the anterior part of the body may be seen a pair of orifices communicating with some transverse conduits, which inside divide themselves into branches; these are the stigmata and air-bearing canals, which constitute the respiratory apparatus of the insect. The small round bodies disposed in pairs on the lateral parts of the abdomen show the nervous ganglions, of which three very distinct pairs may ordinarily be recognized. The female is apterous.

"It may be remarked that the female, however different its aspect from that of the larva, does not undergo what is conventionally called a complete transformation; it is quite different with the male, which after the first modification experiences a complete metamorphosis. As soon as the female has adhered to a leaf, plunging into it its sucker and its filamentous appendages, she provokes in the nutritive functions of the plant a disturbance which is the more manifest as the vegetation is less active. Thus, as I have said above, the best remedy will be that which reaches the larva, or at least the female, before the latter is closely fastened to the plant upon which she has established herself.

"*The Male.*—The larva from which the male proceeds is not distinguishable from that of the female on its exit from the cottony down which forms the mother's nest. The similitude of all the young ones has always appeared to me to be perfect up to the moment when the fall of the antennæ and of the tail indicated the beginning of the modifications which the insect was about to undergo. In this stage, the male larva is denoted by the slightly brown coloration which it puts on, and the rigidity which contracts its teguments. Whilst the female grows rapidly, preserving for a long time its primitive white colour and its transparency, the male seems to progress less quickly, and in some days becomes hard and blackish. It is then found fixed at intervals on the leaves, looking like a dot whose very decided colour at once reveals its presence. Examined with the microscope, it exhibits the structure already described as that of the female, but the whole of its tegumentary envelope is nothing more than a shell, which harbours in its median part a small gelatinous and transparent body, whose rings, head and tail recall the larva of the Lepidoptera; this is the larva of the male 'louse,' which soon veils itself (*se voile*), increases in consistency, becomes of a deep brown and changes to the nymph. When the male has undergone its metamorphosis, it pierces the shell and emerges from it by a hole contrived about the centre of the envelope. It is a very small winged insect, 1½ millimètre long, of thin and elegant form, with rapid and abrupt movements; its body is of a beautiful metallic black, its thorax has a large green disk, and its wings present brilliant red and violet reflexions when the light of a lens is projected obliquely upon them. Its head is adorned with facetted eyes, and with two antennæ, which are relatively long and stout, formed of seven joints. It has three pairs of feet, whose tarsi are surmounted by a sort of slender spur. The tarsi are formed of five joints, and the first of these joints is as long as the four others taken together. Its wings, which are membranous throughout their whole extent, are four in number, and overlap each other laterally. The wings of the first pair are much larger than those of the second pair, which they overlie on all sides. The posterior part of the abdomen presents an orifice with whitish edges, and by the side of it is found a retractile projection surrounded by some long and rigid hairs. This little insect ordinarily remains on the plant where the females have fastened themselves, and uses its wings only to skip short distances. Scarcely has it quitted the shell in which its metamorphosis has been produced than it runs rapidly over the leaves which bear the females, and, passing them in review successively, approaches each of them, performing each time regular and uniform movements. With head erect, wings half spread, and abdomen bent down behind, he hastily mounts the back of the first female he meets, and after stopping there an instant, he faces about, and with equal ardour rushes upon each of the females who may be nigh. The number of males is much less than that of females; I believe that the males do not form more than the tenth part of a whole brood.

"The characters enumerated above induce me to arrange this insect in the order

Hemiptera, and to place it amongst the Homoptera in a genus of the family of Gall-insects. I would propose to call it Gasteralphe, a name which perfectly designates the most prominent peculiarity of its external form."

Professor Westwood remarked that it was perfectly clear, from the description and from the plates, that the insect which Dr. Icéry supposed to be the male of the Coccus was not a Coccus at all; it was a species of Coccophagus, a Hymenopterous (Chalcidític) parasite upon Coccus. The female described was doubtless a true Coccus, the male of which was, he presumed, still unknown. The action which the author had mistaken for the impregnation of the female Coccus was, in fact, the deposition of the eggs of the female Coccophagus in the body of the Coccus. Dr. Icéry's observations on the effect of different fluids on the larvæ were very interesting, particularly as to the powerlessness of water and the rapid action of spirits of wine, which might be explained by the fact that the downy matter surrounding the larvæ, being of the nature of lac, was insoluble in water and soluble in spirit.

Mr. W. W. Saunders mentioned that for some years he had used spirits of wine in his greenhouses for cleansing plants and clearing them from insects; he mixed the rectified spirits and pure water in equal proportions, and this mixture, which was found to answer better than undiluted spirit, was applied with a brush. It was very efficacious in the destruction of the common mealy bug (especially when young) and other common pests, and he recommended it as worthy of application in the greenhouse generally.

Professor Westwood called attention to the Report of a Commission which had been appointed by the Committee of Council for Education to enquire into the causes of decay in wood carvings, and the means of preventing and remedying the same. The insects which in this country were found to be the most injurious, from their habit of burrowing into the wood of furniture, were three beetles of the family Ptinidæ, *viz.*, Ptilinus pectinicornis, Anobium striatum and A. tessellatum. Numerous experiments had been made with carbolic acid, chloroform and benzine, specimens of furniture attacked by the worm being submitted to the action of the vapour of these different substances; other specimens were saturated with corrosive sublimate dissolved in methylated spirits of wine. The conclusions at which the Commission arrived were (1), that the action of the worm may be arrested and the worm itself destroyed by vaporization, more especially by the vapour of benzine; (2), that carved work may be completely restored by an injection of vegetable gum and gelatine, in order to fill up the worm holes and strengthen the fabric of the carvings; and (3), that after the worm has been destroyed, further attacks from it can be prevented by treating the carved work with a solution of corrosive sublimate, either in methylated spirits of wine or parchment size, according to the character of the surface of the wood-work; the strength of the solution being sixty grains of chloride of mercury to a pint of fluid, whether methylated spirit or parchment size.

Paper read.

Mr. J. S. Baly read a paper entitled "Descriptions of new Genera and Species of Phytophaga," in which sixteen new species were described, and four new genera established under the names of Euphæne, Sophræna, Nisotra and Glycernia.—*J. W. D.*

PRINTED BY EDWARD NEWMAN, 9, DEVONSHIRE STREET, BISHOPSGATE, N.E.

27 OC 79

4

On the 1st of every Month, Price SIXPENCE, or, if prepaid, Six Shillings a-year, Post Free,

THE ENTOMOLOGIST, a Popular Journal of **BRITISH ENTOMOLOGY.** Conducted by EDWARD NEWMAN.

No. 1 contains:—Analytical Notice of the Entomologist's Annual for 1864. Descriptions of the Larvæ of Angerona prunaria, Amphydasis prodromaria, Anticlea rubidata and A. badiata, by Edward Newman. Form of Cells. Polymorphism.

No. 2 contains:—Analytical Notice of the Natural History of the Tineina. Descriptions of the Larvæ of Ephyra trilinearia, Anticlea derivata and Coremia unidentaria, by Edward Newman. Insects in Amber and Animé. Luminosity of the Lanthorn Fly. Polymorphism. Hydrilla palustris. Agamogenesis.

No. 3 contains:—Analytical Notice of the Transactions of the Entomological Society of London. Descriptions of the Larvæ of Larentia cæsiata, Cidaria ribesiaria, Platypteryx unguicula and Bryophila glandifera, by Edward Newman; of Pterophorus trigonodactylus, by John Peers. Destructive Economy of Meligethes, by Marshall Fisher. Geophilus electricus as a Food of Coleoptera, by William Harrison. Pterophorus Larva on a Geranium, by N. C. Tuely.

No. 4 contains:—Descriptions of the Larvæ of Acronycta Aceris, Triphæna Orbona, Noctua rhomboidea, Noctua xanthographa, Anchocelis pistacina, Scopelosoma satellitia, Cosmia trapezina, Polia Chi, P. flavocincta, Amphipyra pyramidea and Mania maura, by Edward Newman. Spotting of Tortrix and other Larvæ; Fluid ejected by Tortrix Larvæ, by John Peers. Larval Reproduction in Insects. Early Swarm of Bees, by J. Walton. Forty Thousand Pounds' worth of Butterflies.

No. 5 contains:—Analytical Notice of a Catalogue of the Coleopterous Insects of the Canaries in the Collection of the British Museum. Description of the Larva of Pieris Napi, by Edward Newman; of Tortrix viburnana, Peronia caledoniana and Argyresthia nitidella, by John Peers. Notices of Entomological Periodicals:—The 'Entomologist's Monthly Magazine;' 'Young England.' How many times do the Larvæ of Smerinthus change their Skins? Duplicates offered gratuitously. Larvæ of Agrotis exclamationis, *Henry Reeks.* Larvæ of Zeuzera Æsculi, *James Gilbert.* Receipt for Sugar Mixture for Moths, *Rev. H. J. White.* Larvæ reimbibing ejected Fluid, *George Gascoyne.* Boletobia fuliginaria at Clapham, *Trovey Blackmore.* Dosithea eburnata at Bangor; Eupithecia subciliata at Denbigh, *B. Kendrick.* Acidalia rubricata at Brandon in Suffolk, *Frederick Bond.* "Forty Thousand Pounds' worth of Butterflies," *Albert Müller.* Notodonta bicolor in Ireland. Food-plant of Eupithecia pulchellata. Polyommatus Hippothoë near Westbury. Erastria venustula, *R. W. Wright.* An instance of Parasitism in which a Chrysalis of Chelonia Caja produced living Moth and Larvæ of a Hymenopterous Insect at the same time, *Maurice Girar*

No. 6 contains:—Descriptions of the Larvæ of Anthocharis Cardamines, Gonepteryx Rhamni, Argynnis Paphia, Vanessa C-album, Satyrus Megæra, S. Hyperanthus and Chortobius Davus, by Edward Newman. Larva and Pupa of Ripiphorus paraoxus, *S. Stone.* Multitudes of Syrphus Pyrastri in the Isle of Wight, *William Gibson C. E. Seaman.* Note on Euplexia lucipara, *John S. Dell.* Age of the Larva of the Goat Moth; Sex of Larvæ, *William Gibson.* Peculiarity of the Structure of Chelonia caja, *Henry Moncreaff.* Ophiodes lunaris in Ireland. Nonagria neurica at Horning Fen. Note on Ephyra pendularia, *W. West.* Beautiful Variety of Callimorpha dominula. Toxocampa Craccæ in Devonshire. Food-plant of Ino Geryon. Entomological Society. Sesia Scoliæformis. Food-plant of Coremia unidentaria. Duplicates.

No. 7 contains:—Descriptions of the Larvæ of Chortobius Pamphilus, Polyommatus Hippothoë, Phragmatæcia Arundinis and Zeuzera Æsculi, by Edward Newman. Entomological Periodicals:—'The Entomologist's Monthly Magazine;' 'Young England;' 'The Naturalist.' The reimbibition of Fluid ejected by Tortrix Larvæ, and Peronea permutana at New Brighton, *John Peers.* Gonepteryx Rhamni in Ireland, *Edwin Birchall.* Hybernation of Vanessa C-album, *Rev. E. Horton.* List of Duplicates offered gratuitously. Parasites upon Wasps, *S. Stone.* Locusts in Cornwall, *Thomas Cornish.* Note on Cynips lignicola, *F. Walker.* The Artichoke Gall, *C. Seymour.* Acari on the Wings of Triphæna pronuba, *Rev. E. H. Todd.* Number of changes of Skin in the Smerinthi, *J. R. S. Clifford, Henry Moncreaff.* Taking Moths on the Trunks of Trees, *William Gibson.* Geophilus electricus, *Albert Dumsday.* Pericallia syringaria emerging in October, *William Stewart.* Larva of Acronycta Aceris, *Edwin Tearle.* Entomological Society.

CONTENTS.

Aquaria.—Notes on the Aquarian Zoology of Aberystwith, *W. R. Hughes, F.L.S.*, 9337.

Notices of Books.—'The Birds of India; being a Natural History of all the Birds known to inhabit Continental India,' by T. C. Jerdon. Second Notice, 9341. 'On Poisoning by Diseased Pork; being an Essay on Trichinosis or Flesh-worm Disease, its Prevention and Cure,' by Julius Althaus, M.D., &c., 9349.

Further Natural-History Notes from Norway, *George Norman*, 9354.

Sucklers.—Food of Quadrupeds, *Edward R. Alston*, 9358. Seals off the Coast of Yarmouth, *T. E. Gunn*, 9359. Whales in the Bristol Channel, *David Williams, F.L.S.*, 9359.

Birds.—Redbacked Shrike, or Butcher Bird, in Forfarshire, *Rev. G. Gordon, M.A., F.L.S.*, 9360. Moulting of the Bullfinch, and Remarks on its Food, &c., *Capt. H. Hadfield*, 9360. The Hooded Crow near Moundsmere, *Anthony S. Bradby*, 9361. Hoopoes at Flamborough, *W. W. Boulton*, 9361. The Kingfisher kept as a Cage Bird, *Thomas Marshall*, 9361. Ring Dove or Wood Pigeon nesting in October, *Anthony S. Bradby*, 9361. Pale Variety of the Common Partridge near Beverley, *W. W. Boulton*, 9362. Young Quail near Wakefield, *G. Roberts*, 9362. Ruff and Reeve near Beverley; Knot and Bartailed Godwit, in Summer Plumage, at Filey, *W. W. Boulton*, 9362. Is the Turnstone near Flamborough and Filey in July? *Col. H. W. Newman*, 9362. The Ruddy Shieldrake at Epworth, *Alfred Newton, M.A., F.L.S., &c.*, 9363. Eider Duck at Filey, *W. W. Boulton*, 9364. Longtailed Duck at Scilly; The Great Autumnal Migration of Birds, *Edward Hearle Rodd*, 9364. Gannet at Filey; Black Tern at Filey; Little Gulls off Bridlington Quay; Common Skua at Flamborough Head; Richardson's Skuas off Bridlington Quay; Buffon's Skua at Flamborough Head; Fulmar Petrel near Flamborough Head, *W. W. Boulton*, 9364, 9365.

Fishes.—Maigre off the Land's End, *Thomas Cornish, F.L.S.*, 9366. New British Fishes, *Thomas Edward*, 9366.

Insects.—On the Occurrence of Pieris Rapæ in Canada, *G. J. Bowles, Sec. Ent. Soc. of Canada, Quebec Branch*, 9371.

Proceedings of Societies.—Entomological Society, 9376.

J. Ranson, *York.*—Please send a more particular address: a letter to you has been returned here.

Nearly ready, with a plain Plate, price Half-a-Crown,

THE ENTOMOLOGIST'S ANNUAL for 1865.

John Van Voorst, 1, Paternoster Row.

To Entomologists.

T. LAST, Naturalist, Borough Road, Ipswich, has the following INSECTS FOR SALE, well set and in fine condition, captured by himself, at the under-mentioned prices:—A. Adippe, 2d.; L. Sibylla, 4d.; S. Semele, 2d.; Z. Trifolii, 3d.; Z. Loniceræ, 3d.; N. Senex, 4d.; N. Cristulalis, 3d.; L. Complana, 1s.; A. Villica (bred), 4d.; S. Mendica, 3d.; T. Cratægi (♂), 6d.; P. Populi (bred), 6d.; A: Promutata, 3d.; A. Immutata, 1s.; F. Conspicuata, 3d.; E. Pumilata, 4d.; C. Spartiata (♂ & ♀), 2d.; C. Obliquaria, 4d.; C. Vinula (bred), 4d.; N. Camelina (bred), 3d.; N. Dictæa, 6d.; N. Dodonæa (♂), 1s. 9d.; C. Or, 6d.; D. Orion, 1s. 3d.; L. Pudorina, 6d.; L. Straminea, 1s. 9d.; L. Phragmitidis, 4d.; N. Despecta, 4d.; N. Fulva, 2d.; D. Pinastri, 3d.; A. Aquilina, 4d.; N. Glareosa, 4d.; N. Dahlii, 4d.; X. Cerago & Silago, 2d.; C. Xerampelina, 2s.; A. Herbida, 3d.; H. Dentina, 3d.; B. Parthenias (♂), 3d.; B. Notha (♂), 6d.; A. Pyramidea, 2d.; H. Cribralis (♂), 1s.; C. Phragmitellus (♂), 4d.; S. Ligustri (pupa), 3d.; C. Elpenor, 3d.

All orders punctually attended to and Insects carefully packed. Damaged Insects half price.

London: Edward Newman, Printer, 9, Devonshire Street, Bishopsgate, N.E.

The Zoologist [microform] : a popular miscellany of natural history. -- Vol. 1, no. 1 (Jan. 1843)-v. 23, no. 291 (Dec. 1865) ; 2nd ser., v. 1, no. 292 (Jan. 1866)-v. 11, [no. 426] (Dec. 1876) ; 3rd ser., v. 1, no. 1 (Jan. 1877)-v. 20, no. 240 (Dec. 1896) ; 4th ser., v. 1, no. 1 (Jan. 1897)-v. 20, no. 240 (Dec. 1916). -- London : John Van Voorst, 1843-1916.
74 v. : ill.

Monthly.

LANDMARKS II
(Scientific Journals)

(Continued on next card)

READEX MICROPRINT EDITION

The Zoologist [microform]. 1843-1916. (Card 2)

Vols. for 1897-1916 have subtitle: a monthly journal of natural history.
Editors: 1843-June 1876, Edward Newman; 1877-1896, J.E. Harting; 1897-1914, W.L. Distant; 1915-1916, Frank Finn.
Absorbed by: British birds.
Issues for 4th ser., v. 1, no. 1-v. 20, no. 240 also called v. 1, no. 667-v. 20, no. 906.

LANDMARKS II
(Scientific Journals)

(Continued on next card)

READEX MICROPRINT EDITION

The Zoologist [microform]. 1843-1915. (Card 3)

Publisher varies.
References: Scudder, S. Cat. of scientific serials, 485.
Includes bibliographical references and indexes.
Micro-opaque. New York : Readex Microprint, 1984.
cards ; 23 x 15 cm. -- (Landmarks of science. 2,
Scientific journals)

LANDMARKS II
(Scientific Journals)

READEX MICROPRINT EDITION

Vol. XXIII.
London : John Van Voorst, 1865.
xvi, [9385]-9848 p.